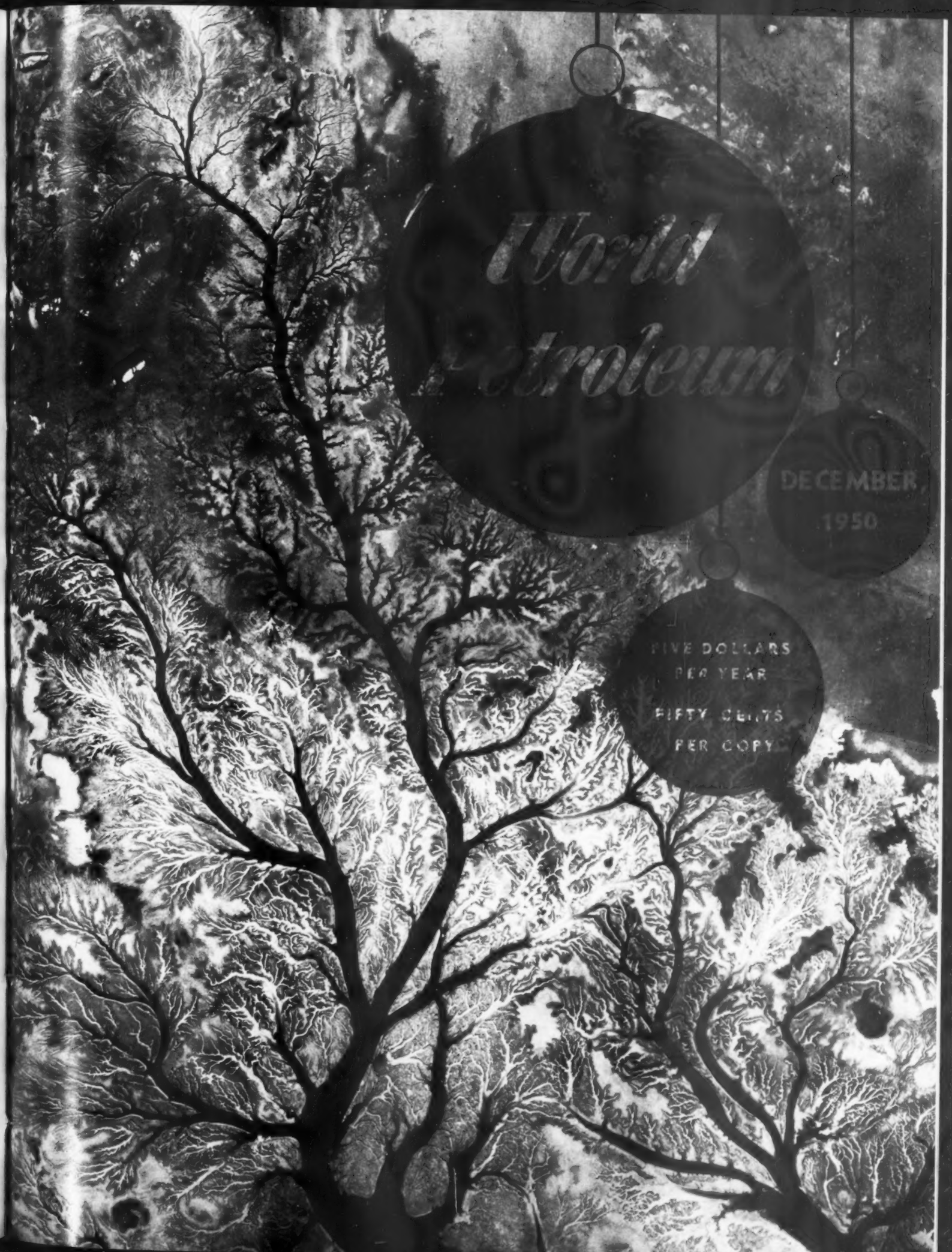
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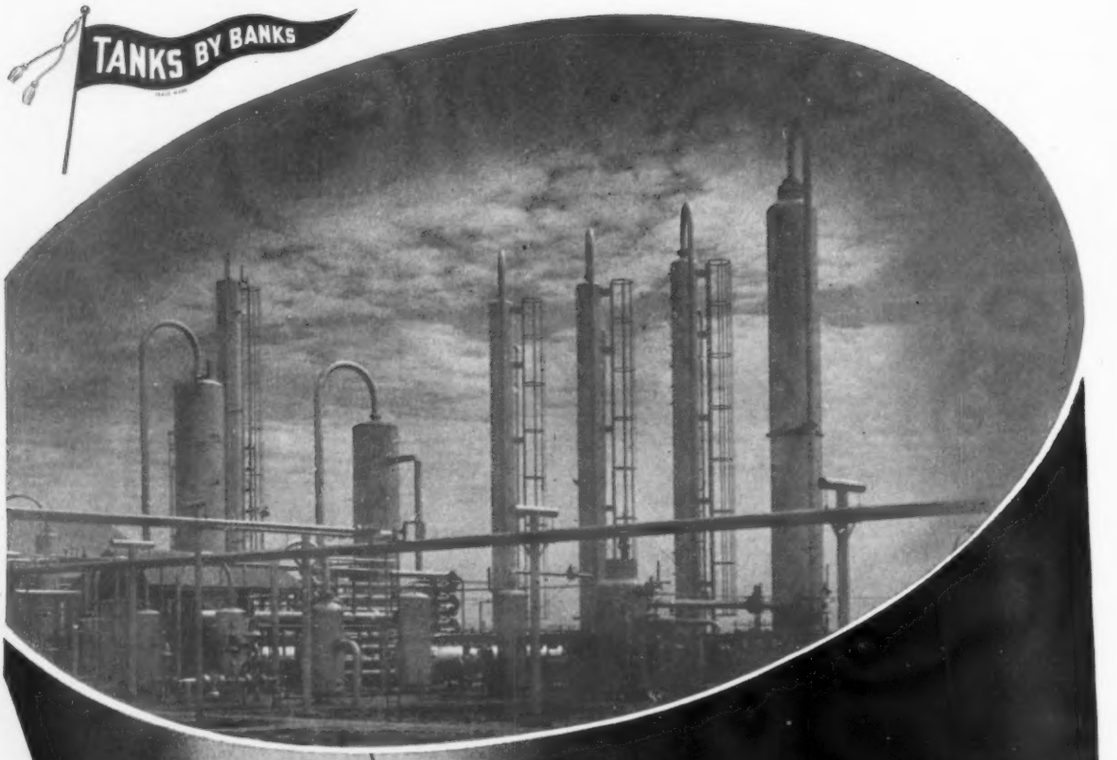

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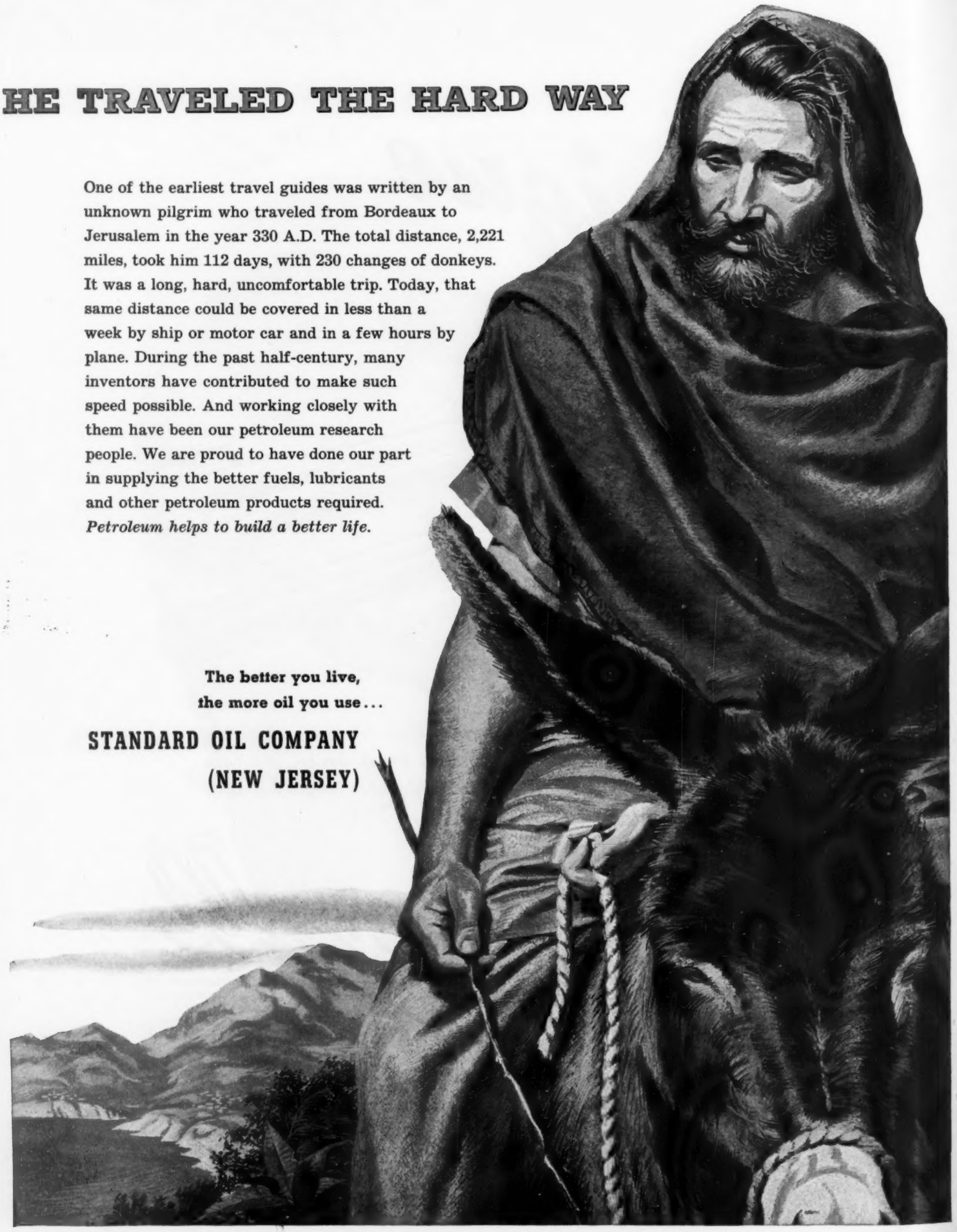

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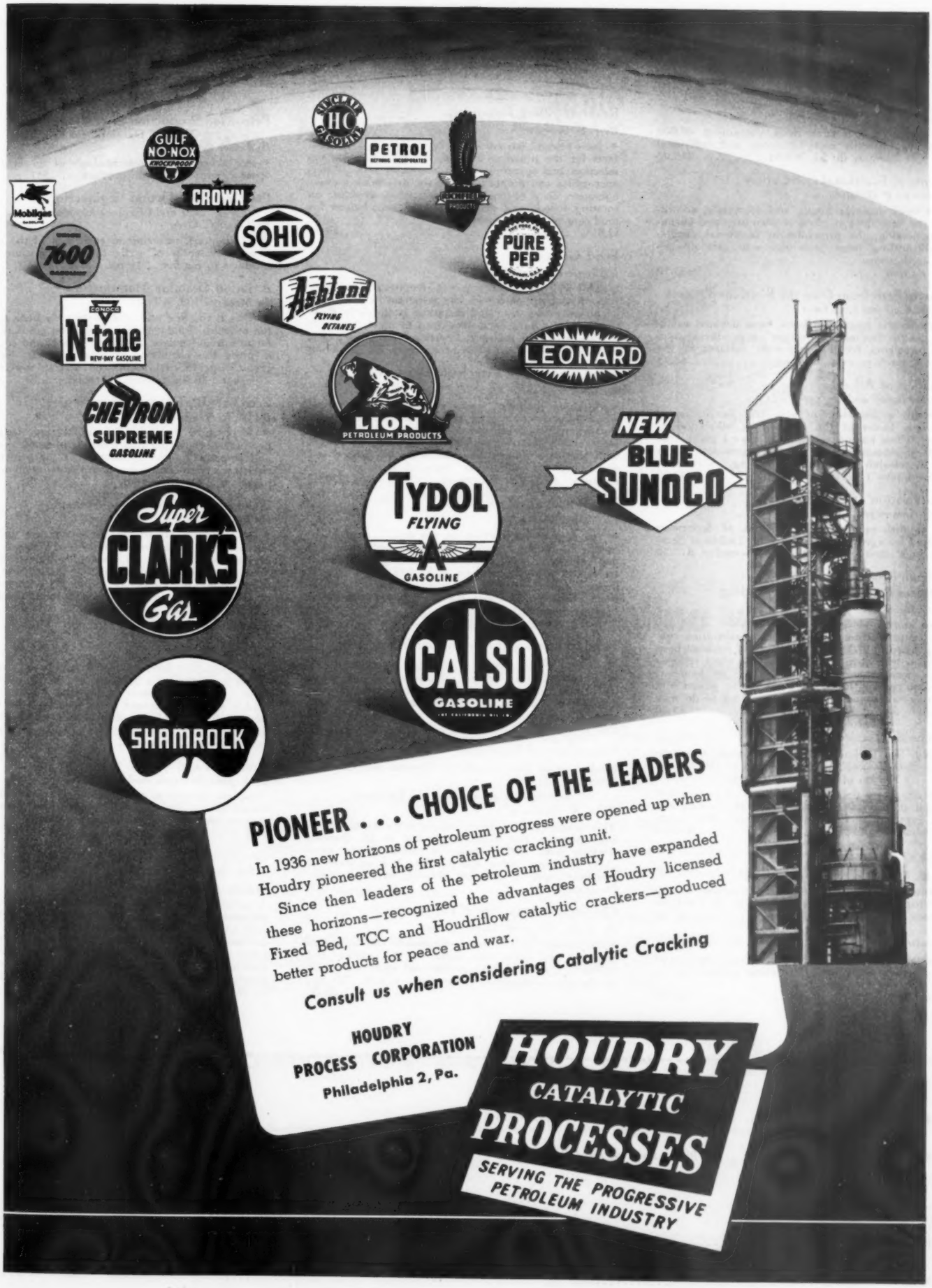
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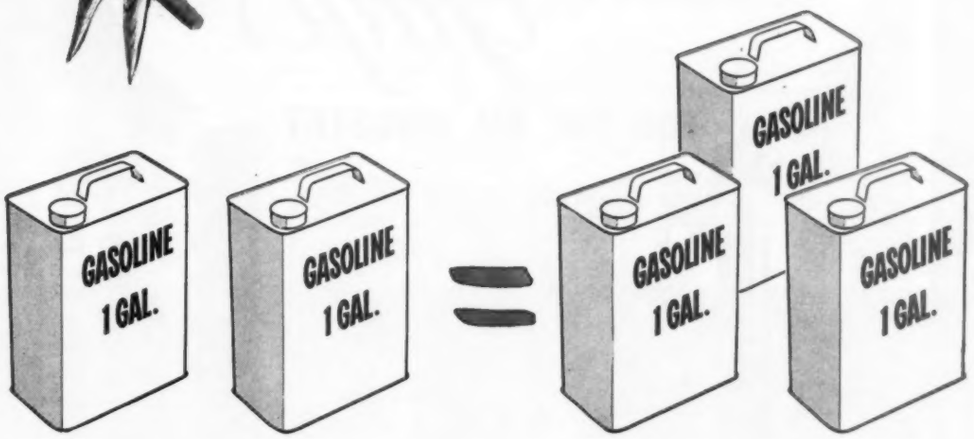

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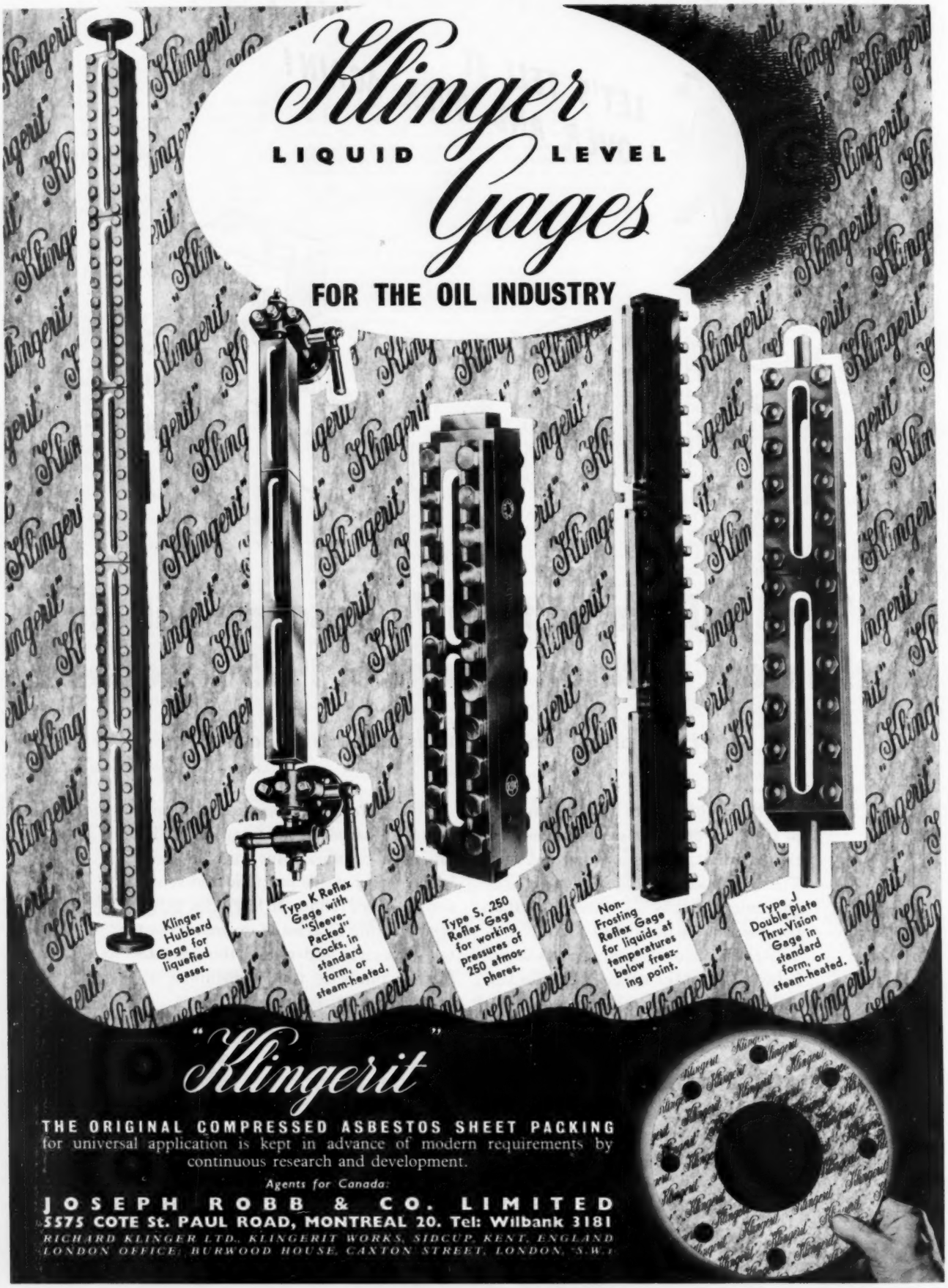
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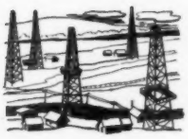

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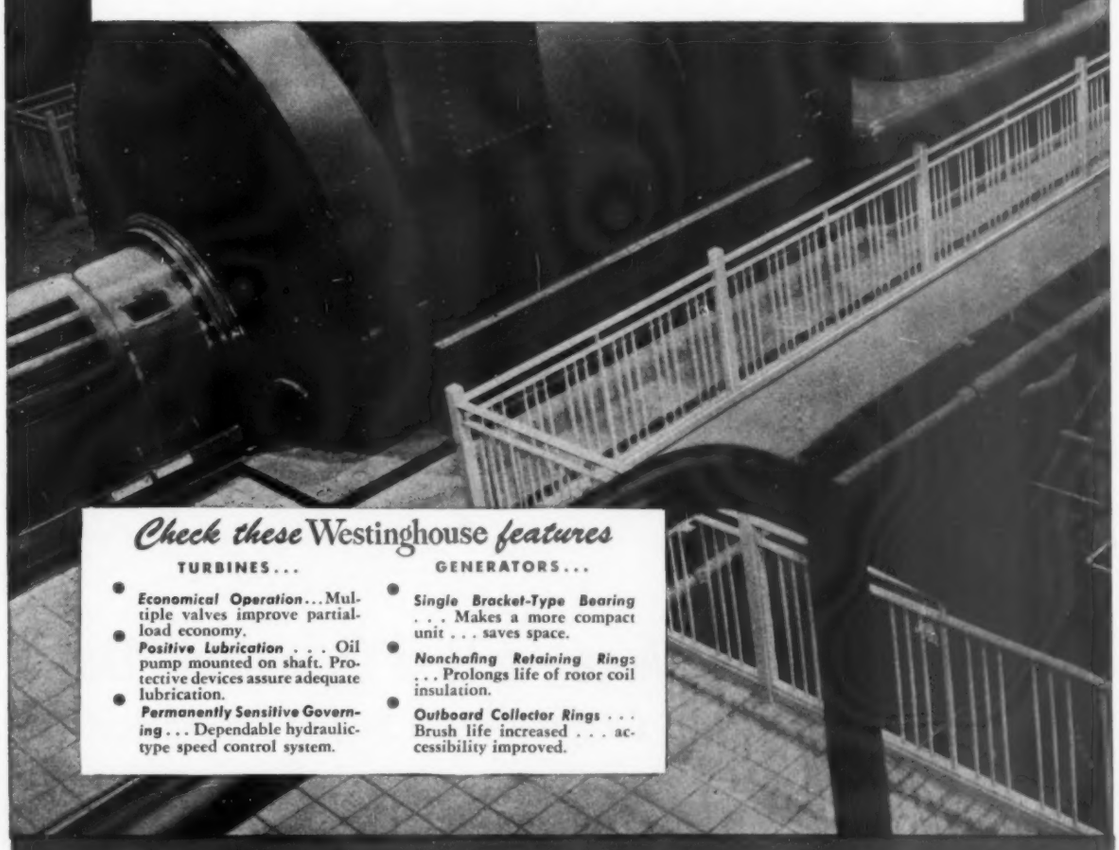

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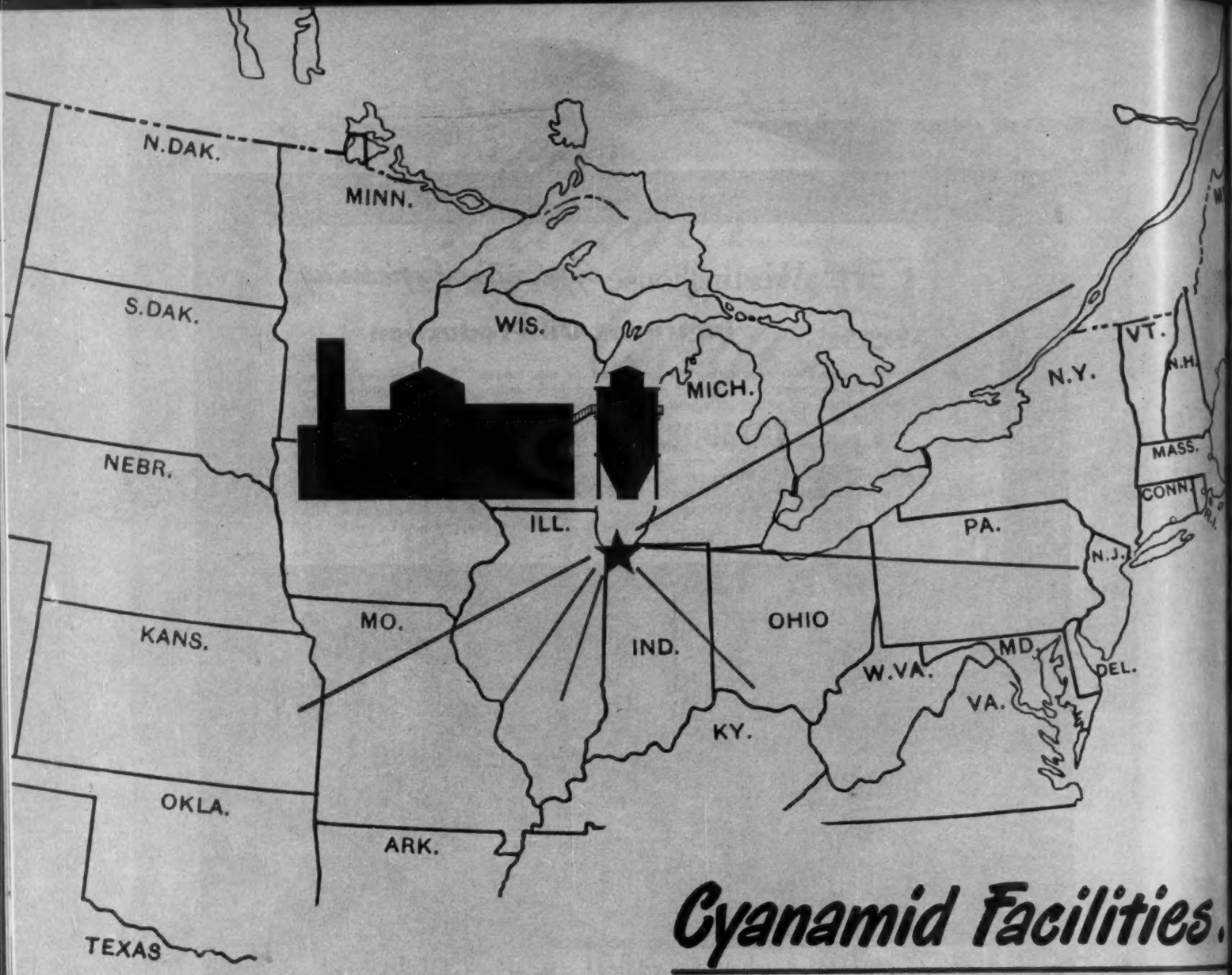

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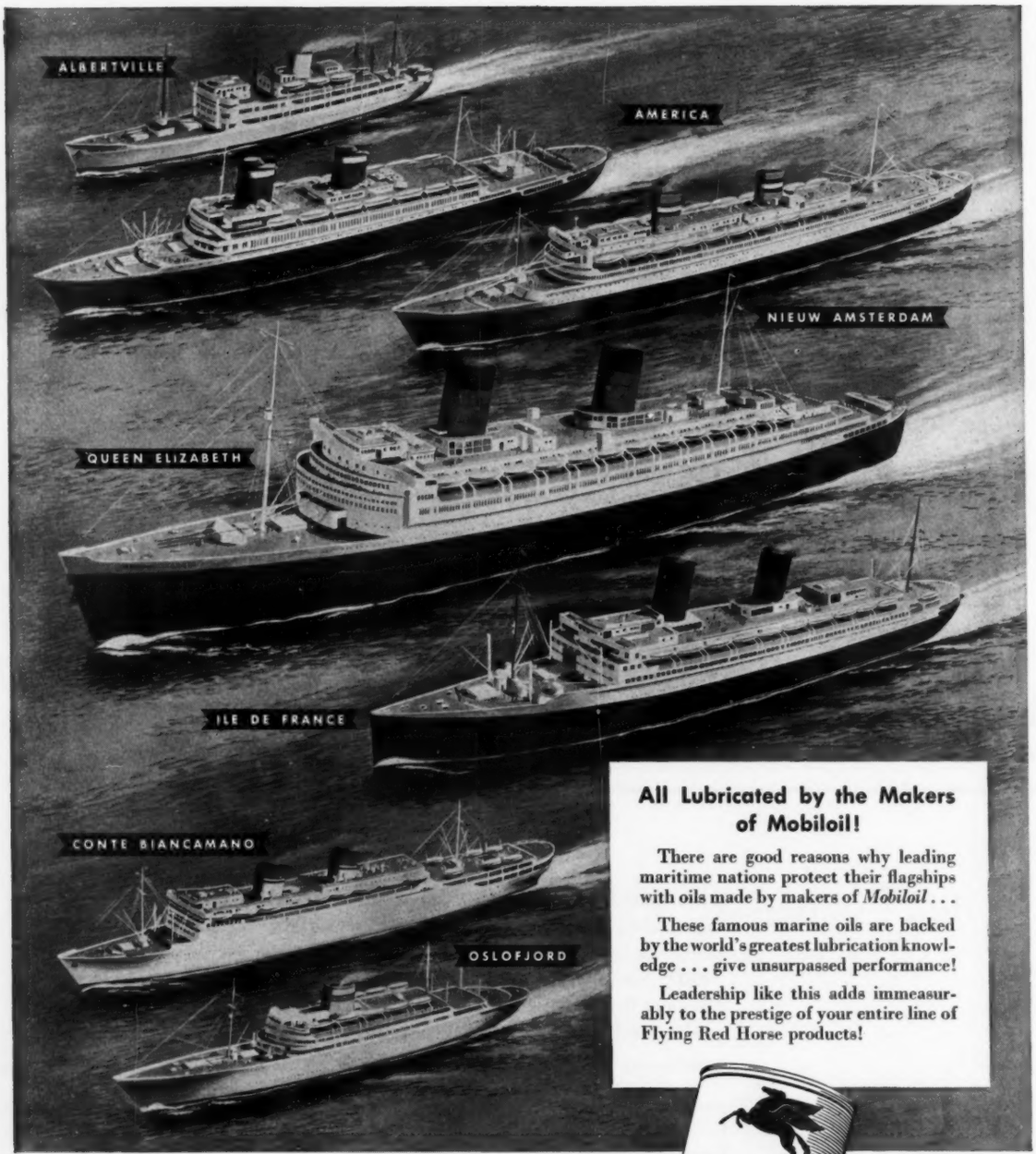

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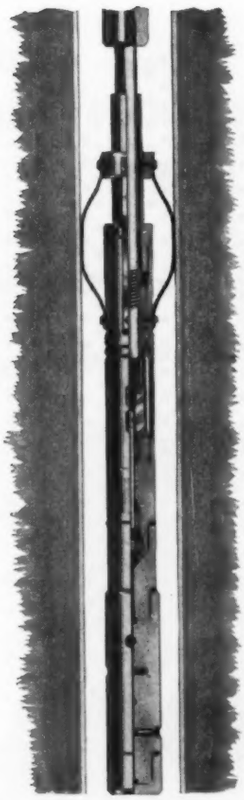

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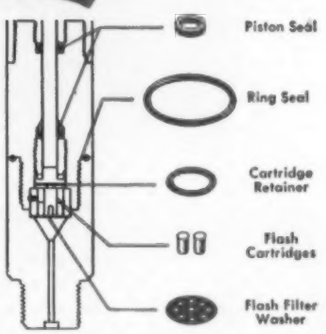

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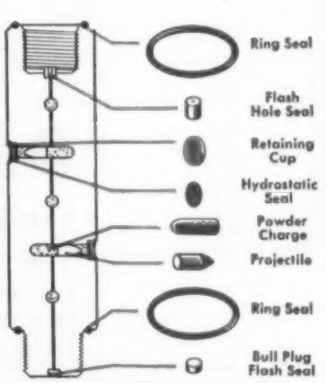

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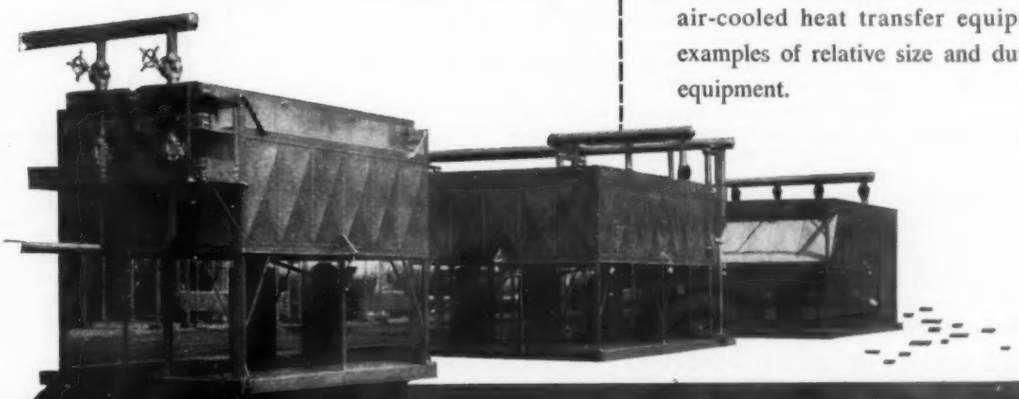

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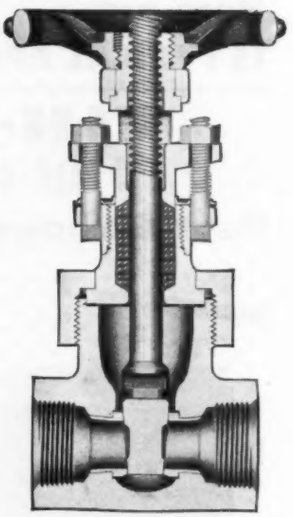

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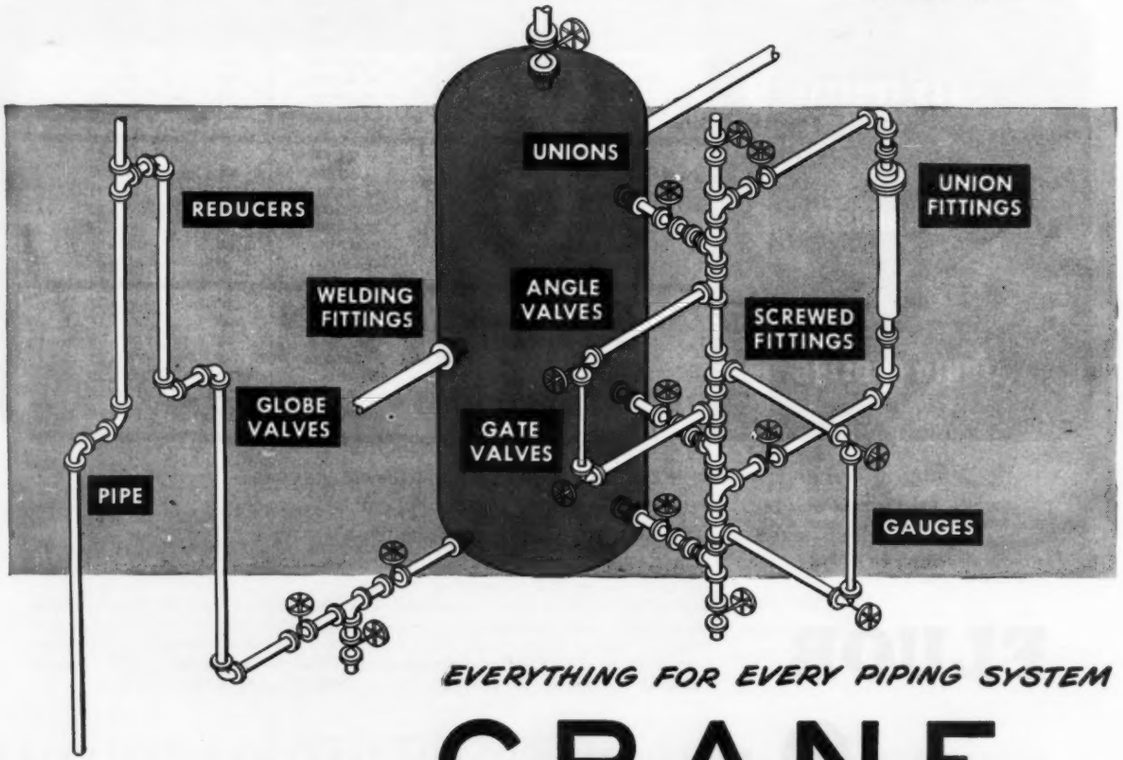

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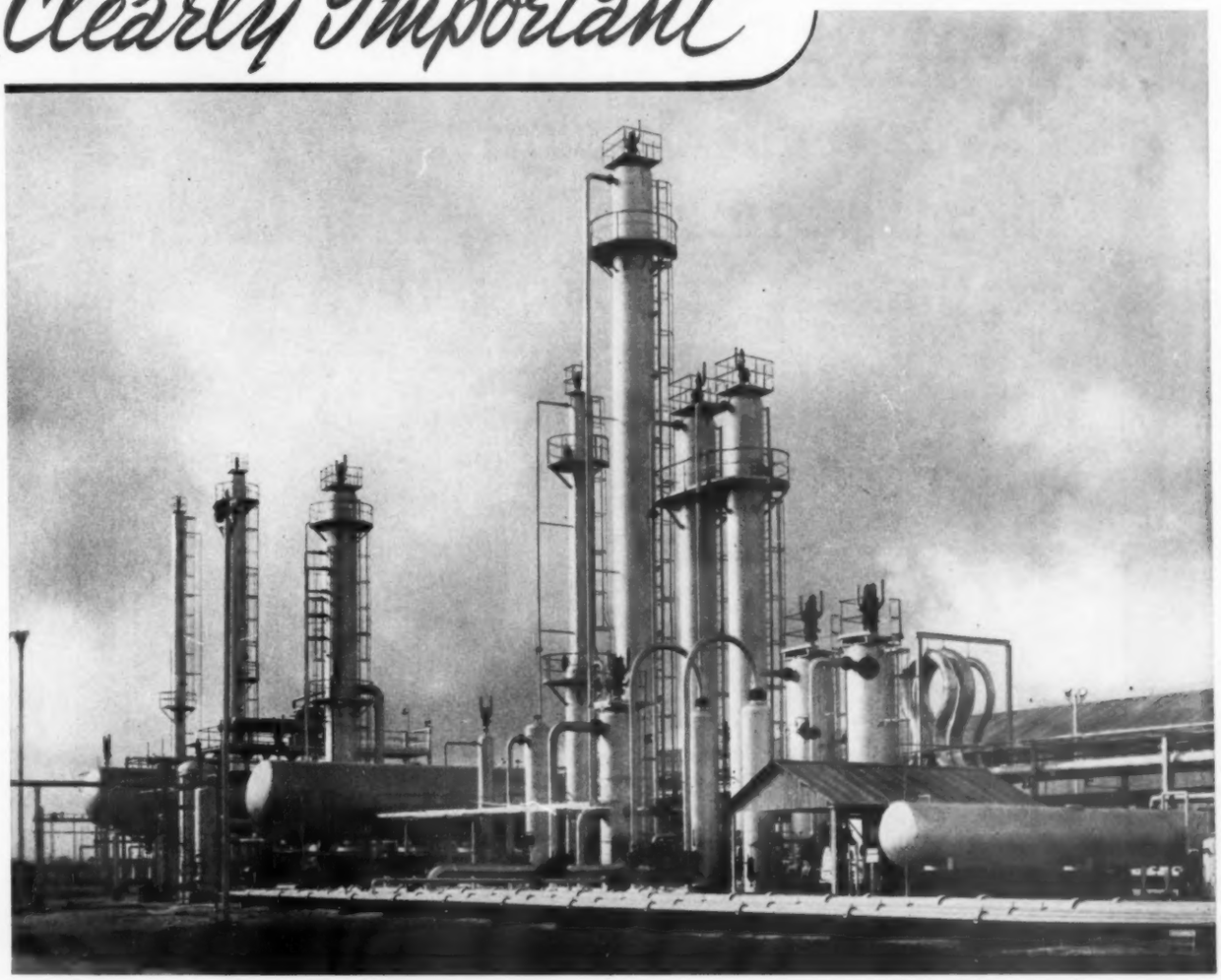

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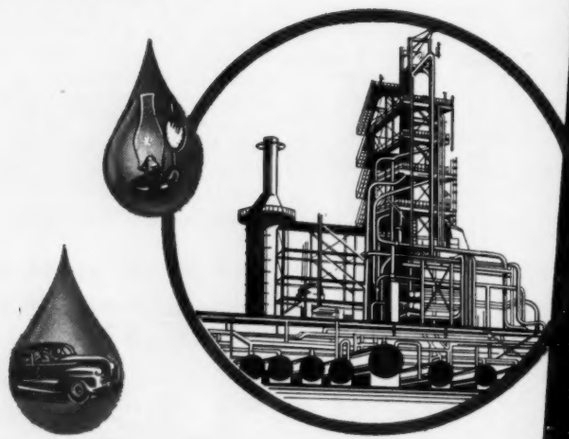

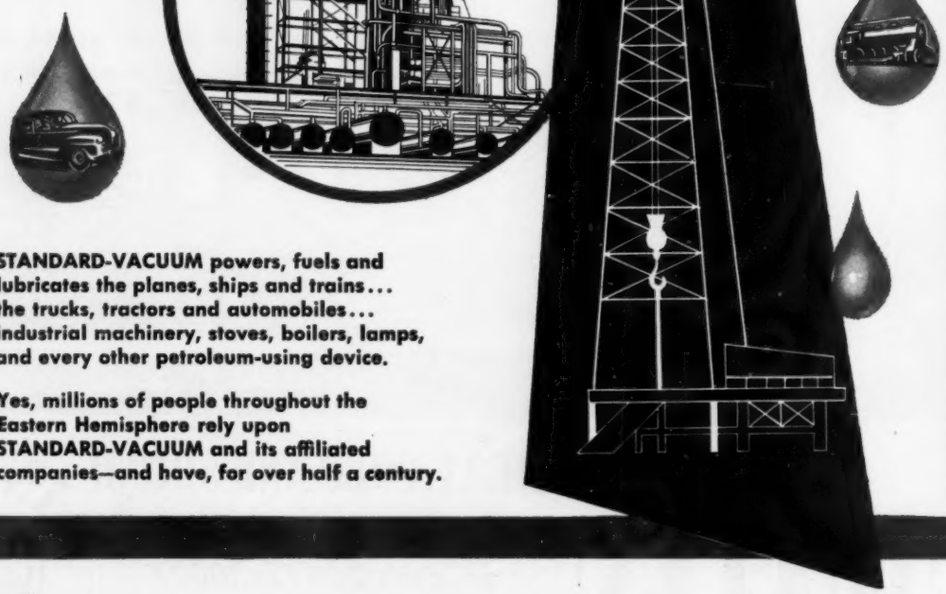

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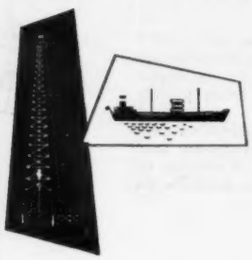

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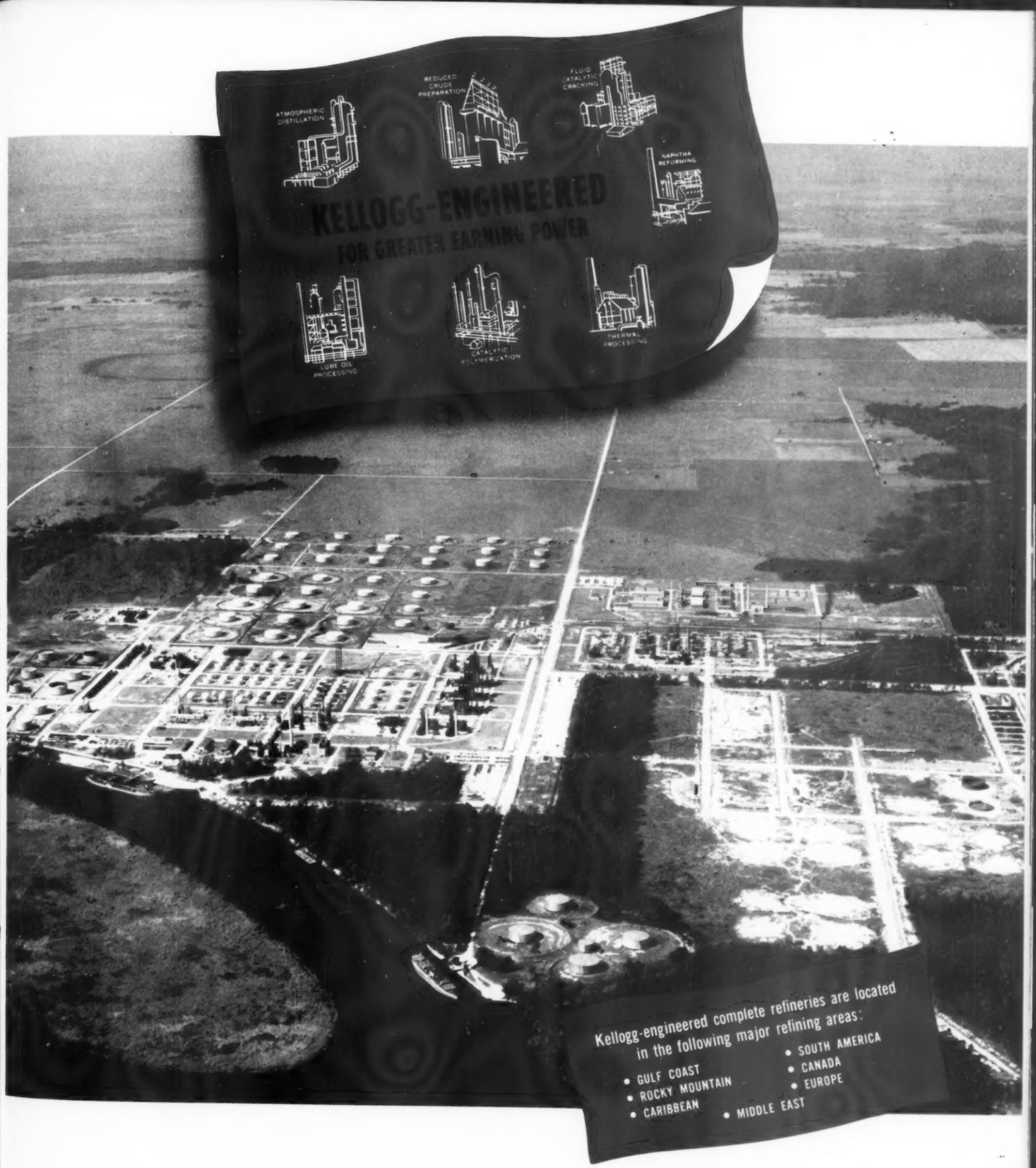

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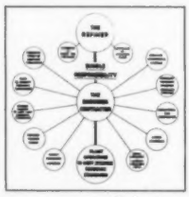
Yes! In addition to more than 450 individual major process units Kellogg has built 10 complete refineries ...with 5 more currently in work!

IN the five short years since the war, Kellogg has undertaken complete responsibility for the engineering and construction of five entirely new refineries in Canada, South America and Europe . . . and in addition has almost matched this task with complete modernizations of three existing refineries. All this in addition to the regular run of individual process unit contracts.

Included in the group of completed jobs are the largest individual contract ever handled by a refinery engineering organization (for a complete 100,000 barrel catalytic refinery at Lake Charles), the original facilities at three of the world's largest refineries (in Abadan, Aruba and Texas City), as well as small and moderate-sized thermal refineries.

No other engineering organization can match that record. Refiners contemplating completely new refineries or major modernizations should investigate the economy and surety of Kellogg *Master* Contracts.

EXPERIENCE, SIZE ARE BASES FOR SUCCESS!



The Master Contract is admittedly a most efficient way for a refiner to handle a major building project. Financial and technical responsibility are centered in one contractor, which has many advantages, chief among which is the fact that a refiner's technical staff is relieved of coordinating details, free to carry on normal activities of maintaining peak efficiency in operating refineries. But unless a refiner can find a contractor with a staff large enough to handle *all* individual phases of a complete refinery *simultaneously*, a project can drag out interminably — thereby costing untold dollars in loss of earning power. Technical personnel in true depth is the basic reason Kellogg has been entrusted with so many major contracts. Of course, today Kellogg also contributes one more "priceless" ingredient to such projects: actual experience gathered over more than a decade of handling the most comprehensive projects in the refinery construction field.

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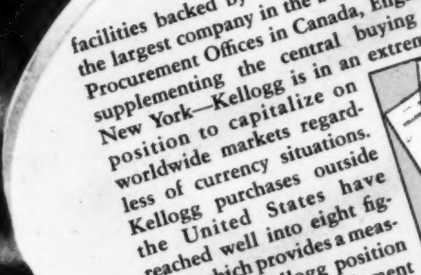

5 COMPLETE FABRICATING FACILITIES
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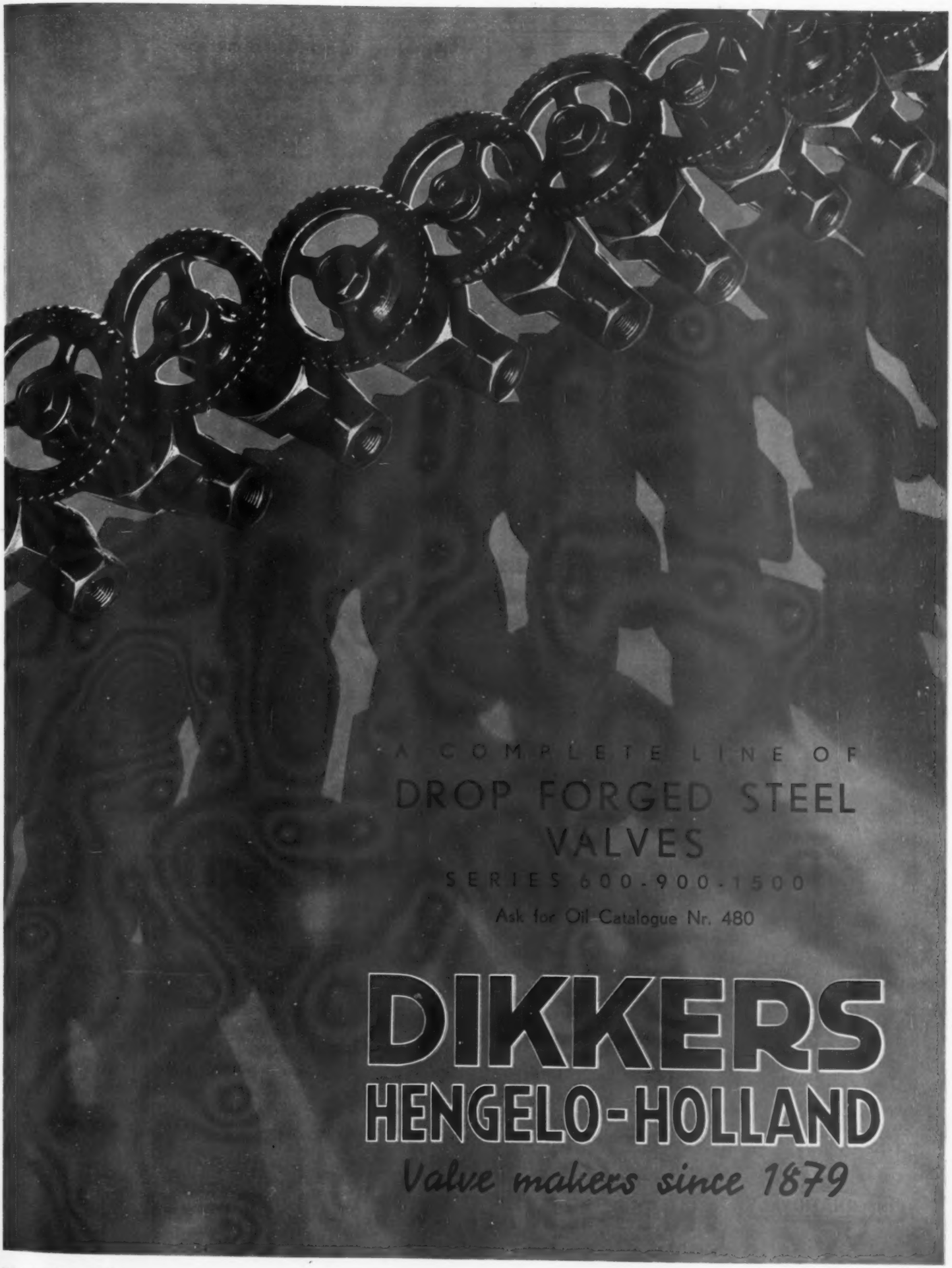
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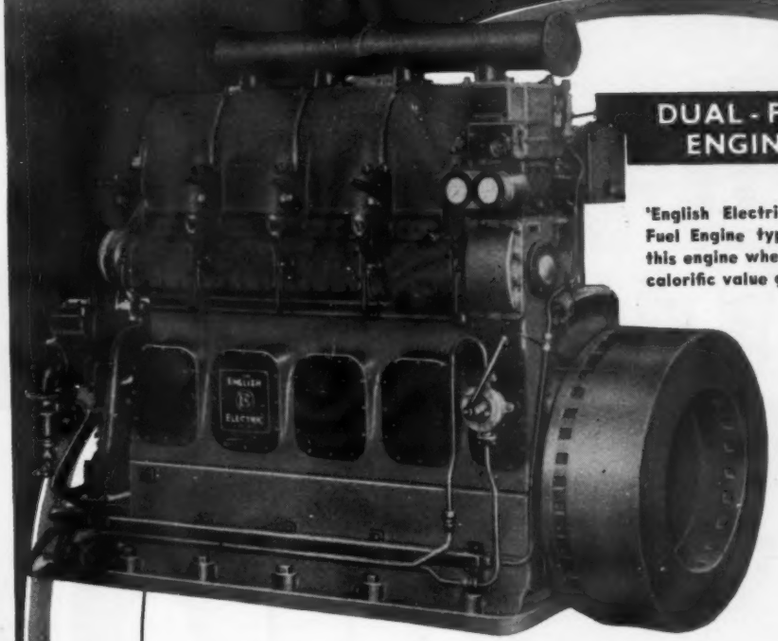

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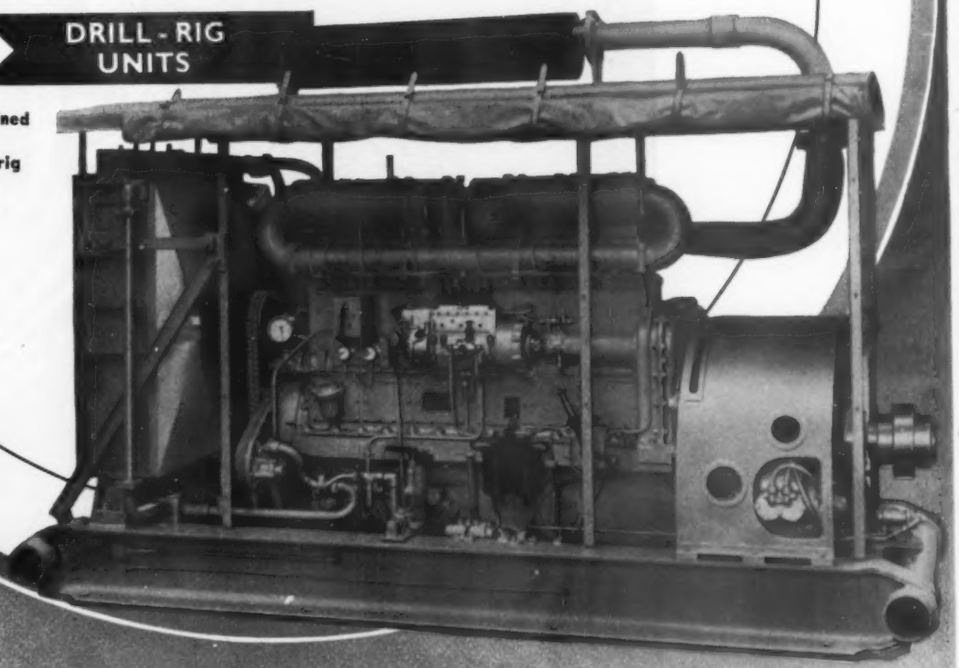

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NEW PLATFORMED GAS

50 YEAR report to our customers -

FROM DATE OF INCORPORATION ON NOVEMBER 23, 1900 TO DECEMBER 31, 1949

THE COMPANY RECEIVED:			
From customers for products purchased by them		$5,122,702,261	
Dividends received, interest earned, and other income		76,068,236	
Total revenues		$5,198,770,497	
THE COMPANY PAID OUT OR PROVIDED:			
For raw materials, supplies, and services bought	$2,766,354,971		
Provision for depreciation (wear and tear or obsolescence) of plants, buildings, machinery and equipment and for depletion of coal, iron ore and limestone, etc., by mining operations	270,852,769		
Federal, State, local and miscellaneous taxes	267,462,953		
Interest and other costs on long-term debt (including dividends of $27,265,805 paid to preferred shareholders)	117,724,128		
Total costs		3,422,394,821	
Leaving for wages and salaries of employees, dividends to shareholders, and amount required to be retained by company for needs of the business		*$1,776,375,676	100.00%
***OUT OF WHICH THERE WAS PAID:**			
Employment costs (pay rolls, vacations, social security taxes, insurance and pensions paid to or for account of employees)		$1,474,693,687	83.02%
To common shareholders as dividends		125,126,950	7.04
Amount retained in the business for present and future needs and to assure steady work for employees		176,555,039	9.94
Total		$1,776,375,676	100.00%

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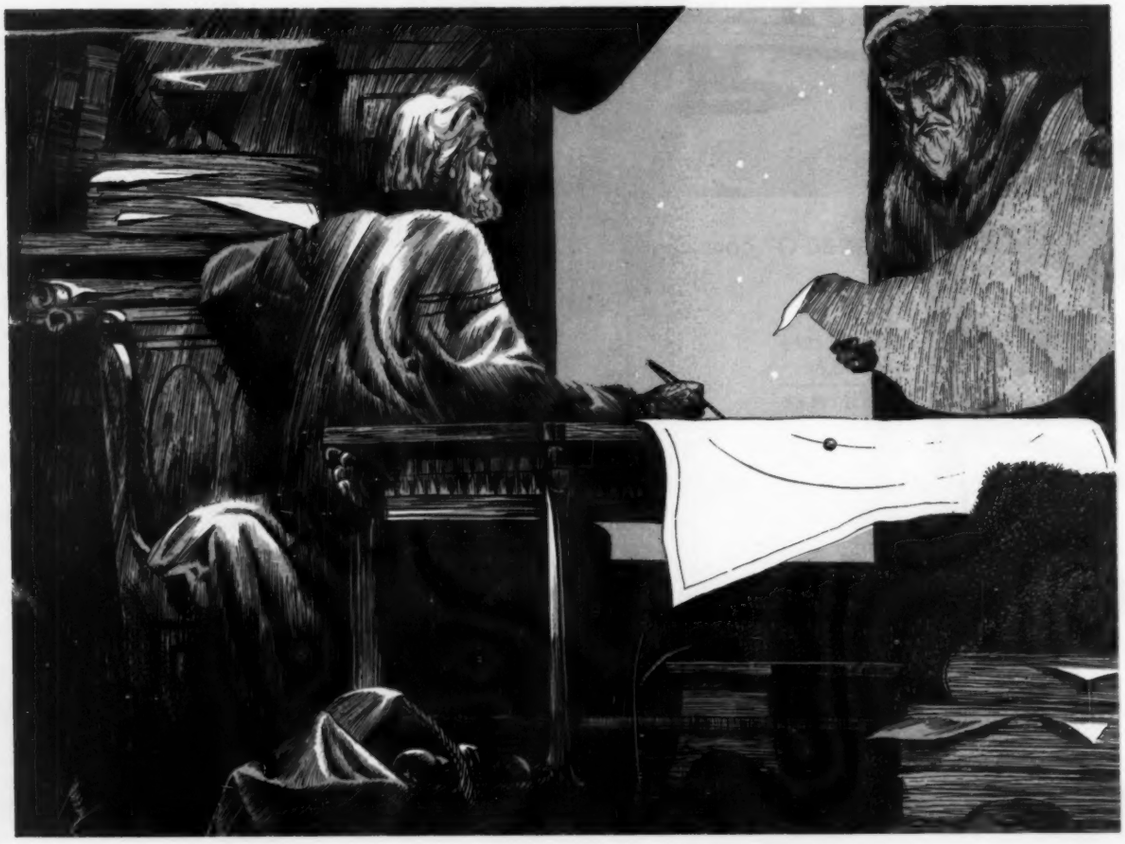
#4 of a Series



The truth about the position of the earth in the universe was not known until about 1543 when a book by Copernicus, Polish astronomer, was published stating that the earth was rotating on its axis, thus accounting for the rising and setting of the heavenly bodies. He taught that the earth, like a number of heavenly bodies, moved about the sun in a circle. Due to the danger of expressing theories of the working of the universe, even in the 16th century, Copernicus was afraid to publish his book so it did not appear until after his death.

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The Management Publication of the International Petroleum Industry

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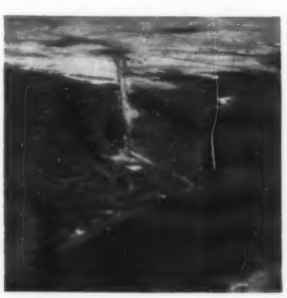
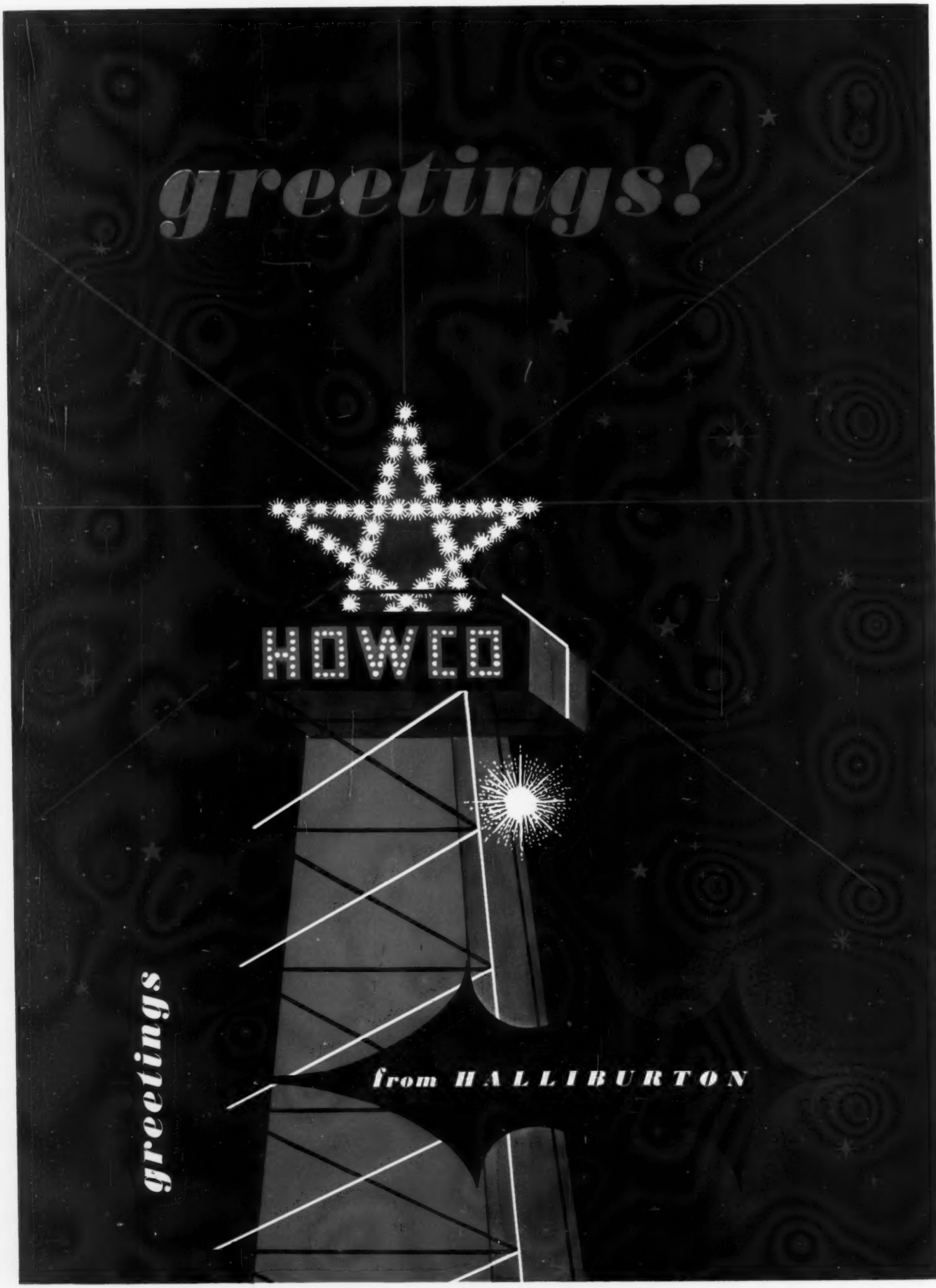


This Month's Cover

Not a seaweed or a section through a human lung—but an aerial view taken from 4,000 feet above Bandar Mashur showing the difficult terrain through which Anglo Iranian laid its latest crude line from Agha Jari. The small photograph at the (left) shows the same area after the pipeline was laid to the loading jetty at Bandar Mashur. Near the terminus the line was laid on trestles. Photos courtesy Anglo Iranian Oil Co. Ltd.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greetings
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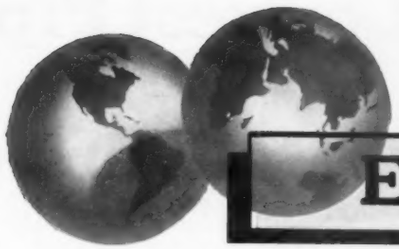


Editorial

Oil Industry Recognizes National Responsibility

IN the assemblages that bring together members of the oil fraternity, whether by the thousands as in the recent annual convention of the American Petroleum Institute on the Pacific Coast or the hundreds who attend the local and sectional meetings that take place week by week in one part of the country or another, one dominant note is observable. It is the feeling of responsibility which the industry as a whole and its individual members recognize as resting upon them to a steadily growing degree. This is not merely a responsibility toward hundreds of millions of consumers of oil products to enable them to pursue their daily tasks and travels in security and comfort but a deeper concern for the national security and welfare, which the pressure of events has lodged so vitally in the hands of oil men. This is no sudden development but the growth of years as petroleum's progress has vastly widened the scope of its operations and increased dependance upon it in peace and in war. It is, however, a heritage acquired. In its early days the oil business, like many another, was fighting to make a place for itself. It performed a valuable function in bringing better light to millions of people around the world. Its few products were useful but hardly indispensable and it had strong competitors. It had not yet transformed surface transportation nor made possible the conquest of the air. Its contribution to the total volume of power consumption was minor, whereas today it exceeds all other forms of energy.

While the start of the petroleum age dates from the turn of the century and the rapid spread of the internal combustion engine, it was the experience of two world wars that demonstrated the decisive role of oil in military operations and made it clear that in a third global struggle the possession of liquid fuel in almost limitless quantity, or the lack of it, would tip the scales to victory or to destruction.

The dual task of the oil industry under existing conditions has been defined by a military man who is himself familiar with industry conditions in the following terms: In time of peace to provide the types of products in the quantities required by constantly expanding industrial activity; in time of war to provide a vastly increased output of conventional products together with specialized requirements for military use. This latter specification, as he points out, implies the peacetime accumulation of large reserve productive capacity that can be made immediately available in time of emergency along with transport and refining capacity that can be readily enlarged.

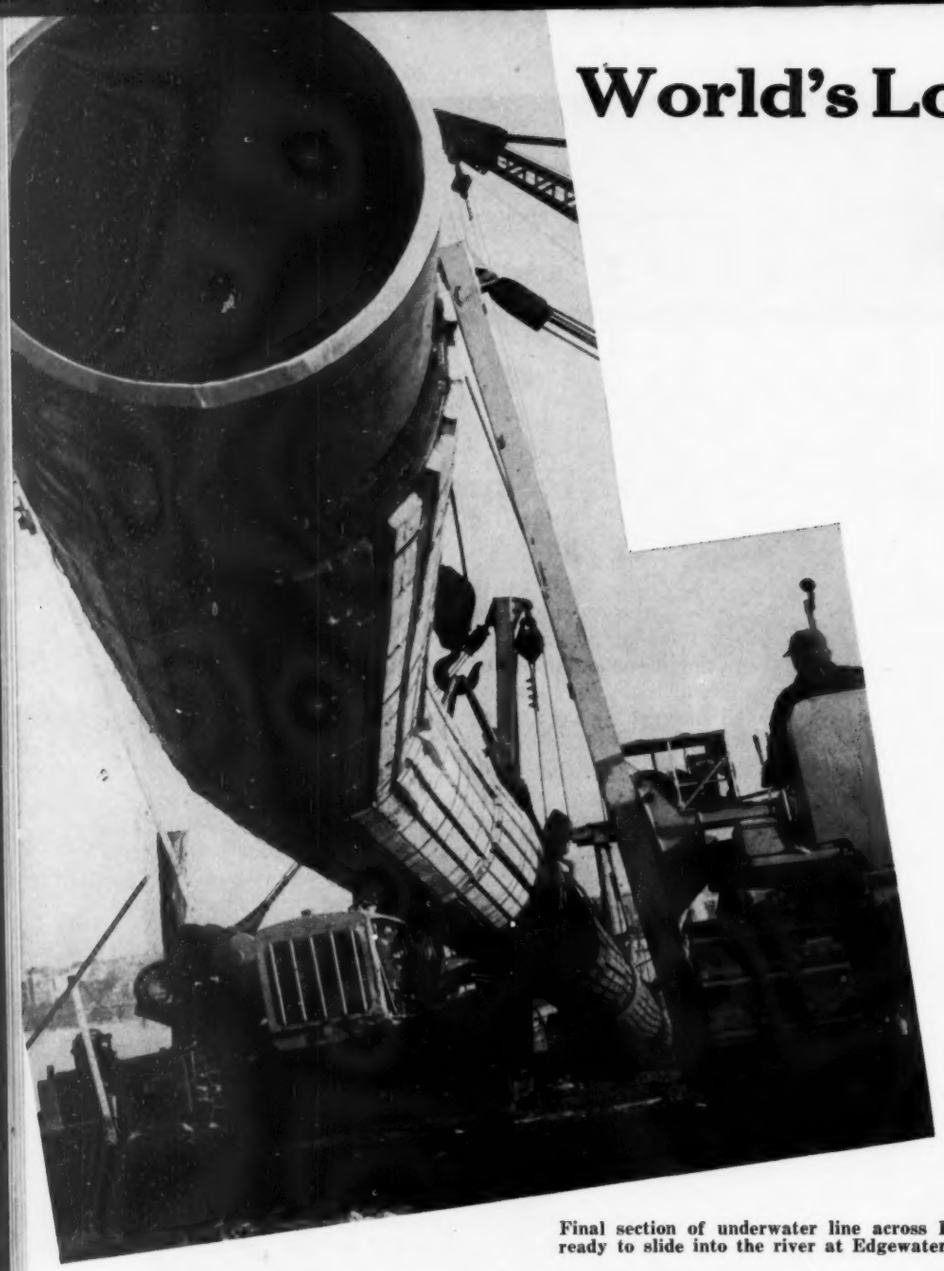
To meet the rapid growth of civilian needs the oil industry has had to undertake herculean tasks. With consumption increasing at a rate that adds a quarter million barrels or more daily from year to year it has had to expand its exploration fifty percent in the face of rising costs and mounting difficulties in finding new fields in order to maintain the level of known reserves. To put on tap an underground supply sufficient for a sudden emergency necessitates still further intensification of the search for oil. After spending billions of dollars on the construction and improvement of refineries the industry faces the necessity of further broad enlargement to meet ever mounting demands. Thousands of miles of pipeline for oil and gas are laid each year but they remain inadequate for pressing needs. Hundreds of millions are expended yearly in research and experiment to eliminate waste and get more products of value from each barrel of crude. The industry's standards of efficiency are steadily rising but the costs of operation mount even more rapidly and the thirty-billion-dollar investment on which it must earn returns sufficient to maintain financial health requires huge yearly additions.

While the industry takes pride in its record of having met every national need no matter how heavy or unexpected the demand may have been, it is unfortunate that so much of its time and effort has to be expended in fending off attacks from the agencies of government that if successful would impair its ability to serve with the highest degree of effectiveness.

Dealing as it does with a wasting resource and facing the necessity of replacing its working supplies at relatively frequent intervals the oil industry is allowed a depletion rate to make this possible, but at every session of Congress the attempt is made to reduce or abolish this depletion allowance, when it should more logically be increased. Should one of these attempts succeed it would cause exploratory effort to wither or to cease with disastrous effect upon the all-important known reserve. Efficiency attained through integration is attacked in the courts as a move toward monopoly and proposals for the dismemberment of integrated companies are advanced with the regularity of the seasons.

The oil industry deserves and should be permitted full opportunity to exercise its initiative and ability in meeting and solving its exceptional problems. This is not merely a matter of justice to the industry but is essential to national security for which petroleum is a first line of defense.

World's Longest Pipe Line Delivers Gas to New York



Final section of underwater line across Hudson ready to slide into the river at Edgewater, N. J.

WITHIN a few days natural gas from the Gulf Coast will be flowing through gas mains in New York City, nearly 2,000 miles from the wells from which it was produced. Thus will be completed one more link in the nation's 275,000-mile network of natural gas pipe lines, a mileage exceeding that of Class 1 railroads in the United States. Except for New England and the Pacific Northwest nearly every important consuming area in the country now is served with natural gas and a supply for New England is in the offing.

Supplier of natural gas for New York City and vicinity is Transcontinental Gas Pipe Line Corp., which was organized nearly five years ago, in February 1946, by Claude A. Williams and associates. This $240 million corporation originally planned to purchase the War Emergency big and little inch lines and convert them to gas carriers. Subsequently it was decided to build an entirely new line. The system to be completed during the first week in December will be the longest single-project construction venture ever built. The 540,000 tons of steel pipe required for

A section of 26-inch pipe being drawn across the Hudson River from the New Jersey shore.

the line was laid in 18 months from the time ground was broken on May 23, 1949.

As originally planned the line was to deliver 340 million cubic feet of gas daily to the New York-Philadelphia area. As construction was carried on markets were developed to the point that Transcontinental found it necessary to revise its plan and ask the Federal Power Commission for permission to deliver 505 million feet. This necessitated increasing the financing from the original $191.5 million to $240 million in order to build additional compressor stations, and increase the size of pipe over 362 miles of the line.

Gas supplies for the line have been placed under contract in 34 fields along 600 miles of the Gulf Coast traversed by the line from its terminus in the Rio Grande valley near Brownsville, Texas, through Louisiana. Gas reserves are calculated to supply the line at maximum present capacity for 20 years. The line traverses an area rich in gas fields so that additional supplies can be lined up when necessary. Potential demand in the Transcontinental marketing area has been estimated at two billion cubic feet per day within ten years. At the moment Transcontinental is seeking permission to serve New England through the sale of 100 million cubic feet daily to Northeastern Gas Transmission Co. and there has been talk of looping the line to increase its capacity.

In the Philadelphia-New York area Transcontinental will sell its gas to distributors of manufactured gas now operating in the various communities. Natural will be mixed with manufactured gas to enrich the stream, but not to the point where appliance conversion will be necessary, except in certain areas of New Jersey where straight natural gas will be served. Present distributors connected to the line are: Consolidated Edison Co. of New York, Brooklyn Union Gas Co., Public Service Electric & Gas Co., Philadelphia Electric Co., Philadelphia Gas Works Co., Long Island Lighting System, Kings County Lighting Co., Brooklyn Borough Gas Co., South Jersey Gas Co., and Elizabethtown Consolidated Gas Co. Homes in the following areas will share in the benefits of the gas transported by Transcontinental: four boroughs of the city of New York; substantially all of Westchester County, N. Y. and Long Island; much of northern New Jersey including Newark and Elizabeth; the Atlantic City area; portions of Delaware, Chester, Montgomery, and Bucks counties, Pa.; and Wilmington, Del. Other distributors in Virginia, the Carolinas, Georgia and Alabama also will tap the line.

Controlled blasting in congested areas was necessary in approaching the Hudson.

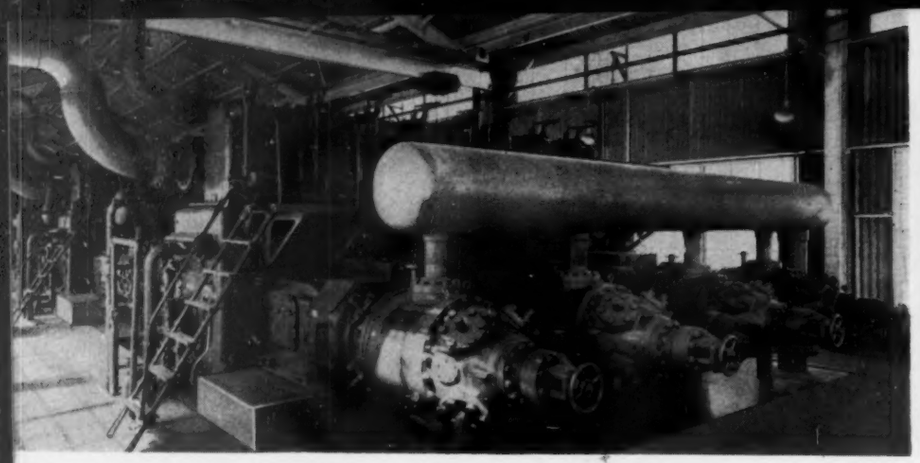
Claude A. Williams, organizer and president of Trancontinental Gas Pipe Line Corp.

Robert Stewart Bruns, Jr., vice president of Transcontinental is in charge of all phases of the corporation's Eastern operations.

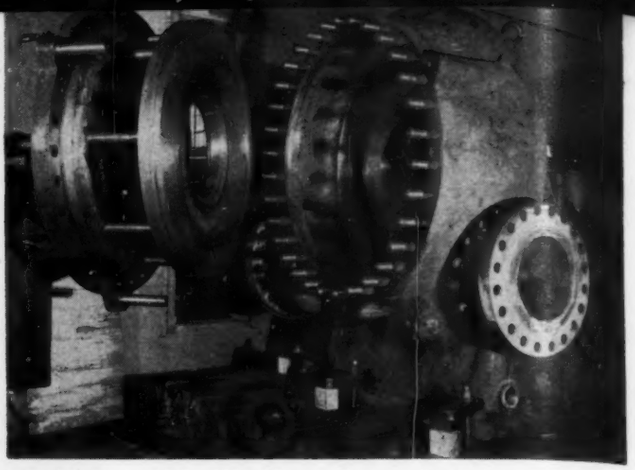
A battery of Cooper-Bessemer Type GMW-10T 2,400-hp engines such as have been installed in nine of the Transcontinental stations.

Of the 40 major river crossings necessary in the construction of the line, that across the Hudson from Edgewater, N. J., to 135th Street, New York City, has been the most difficult of accomplishment. As a navigable stream accommodating ocean-going craft it has been necessary to work closely with navigation authorities as well as to take unusual safety precautions. At the point where the line crosses, the banks are solidly built up with industrial establishments and dwellings. The river is a mile wide and averages 40-feet deep. It is busy with shipping from all parts of the world. Large vessels drop anchor so that the line must be deeply buried to avoid fouling dragging anchors.

After consultation with river authorities it was decided that the line should be buried 25-feet below river bottom. Since the bottom is free of rock and made up of a layer of silt at least 100-feet thick it was thought pos-



Battery of Clark Brothers BA-8 1,600-hp compressors installed at the Orange, Virginia, station.



Assembling one of the 600-million cubic foot single stage compressors at the Trenton, N. J., works of De Laval Steam Turbine Co.

All welds in the 1¼-inch wall pipe used for the Hudson River crossing were examined by X-ray.

Magnetic hoist loading 30-foot sections of 30-inch pipe at the Los Angeles plant of Consolidated Western Steel Corp.

sible to achieve the necessary depth by high pressure jetting as the line was lowered. Subsequently this was proved to be impractical because the silt was too greatly compacted. Result was that a 25-foot deep by 30-foot trench had to be dredged out. At some points the trench was 50-odd feet wide in order to take care of the flow of silt.

The 26-inch pipe used for the Hudson crossing has a wall thickness of 1 1/8 inches for extra safety and to overcome buoyancy. This compares with 5/16 or 3/8-inch in cross-country stretches and 1/2-inch in congested urban areas. In addition to normal protection against corrosion the line in New Jersey north of the Rahway River is given a coating of asbestos cement.

Pipe for the Hudson crossing was assembled and welded into 300-foot sections at Edgewater, N. J., before being pulled into the river. Somastic coating was protected during the laying operations by oak sheathing.

Of the 40 major crossings on the line four were by bridge, the longest of which, across the Atchafalya, has an overall length of 3,650 feet. The Coosa River crossing required the construction of 218-foot towers for cable supports. Bridges were employed to cross rivers with unstable bottoms, high and steep banks or where water was excessively deep.

Nine rivers were crossed with multiple lines. These were resorted to in swift current streams and for exceptionally long crossings. Single lines were laid across 27 streams.

Difficult swamp conditions were encountered at many points in the Gulf Coast area in Texas and Louisiana and at some points in Mississippi as well. Excess rainfall created trouble in some areas where difficulties in trenching, dewatering and backfilling had not been anticipated. Much extra pumping equipment was required in some sections and it was necessary to lay pipe as fast as ditch was prepared. Some sections of pipe had to be dragged into place and weighted down with clamps to decrease buoyancy. In some places not enough backfill was available adjacent to the trench because of current conditions. Quicksands added extra hazard and rip-rapping was required in some places.

In the eastern section line laying was complicated by the density of population and the great number and variety of underground facilities which had to be avoided at every street and highway crossing. Rock excavation was a major job at the Palisades on the west bank of the Hudson. All of the pipe was double-jointed to 60-foot lengths at railroad unloading points to reduce field welding.

Despite the difficulties it was possible to maintain schedules during the 18 months the line was being laid. Last year 603.84-miles of line was laid and in 1950 the mileage completed was 1,227.80.

Approval on April 28, 1950 of the increase in capacity to 505-million cubic feet caused a change in the size of pipe from 26 to 30-inches in one 362-mile section and the construction of 12 additional pumping stations. This added job also was taken in stride.

When all of the added pumping stations are completed the 20 will have a total horsepower of 211,200. Four of the stations are in Texas, one in Louisiana, two in Mississippi, three in Alabama, two in Georgia, one in South Carolina, two in Virginia, one in Maryland, and one in Pennsylvania.

Three of the stations are to be equipped with steam driven centrifugal compressors. The remaining 17 are gas engine driven compressor equipped. Cooper Bessemer Corp. and Clark Brothers Co. each supplied compressor equipment for nine stations. De Laval and Ingersoll-Rand each equipped one station. The Cooper-Bessemer units are 2,400 hp angle units and the Clark Brothers units 1,600 hp with 17-inch bore and stroke and operate at 300 rpm.

Compressors of high horsepower rating and high compression were selected because of the fuel economy and collateral savings such as reductions in size of buildings, concrete for footings, reductions in cooling system piping, pumping and other facilities. Selection of the very large compressors caused the builders to use unusual care in piping design to minimize pressure drop. Maximum drop at stations was set at 10 psi. Stations were built with basements to aid in simplifying piping design and provide low cost housing for auxiliary facilities.

Centrifugal compressor stations were installed at three locations where ample supplies of water are available for the steam plant. Individual compressors at these stations have a large excess capacity so that it has been deemed unnecessary to install standbys. The two De Laval single stage centrifugals each have a capacity of about 600,-million cubic feet and each requires a 5,000 hp turbine. Similarly Clark Brothers is supplying three 5,100 hp compressors for another station. The Ingersoll-Rand compressors are of similar capacity.

Gas cooling was undertaken at compressor stations when it was found that inlet temperatures would run from 70 to 80°F. in sum-

Laying the large diameter line through populated areas in the East often presented problems.

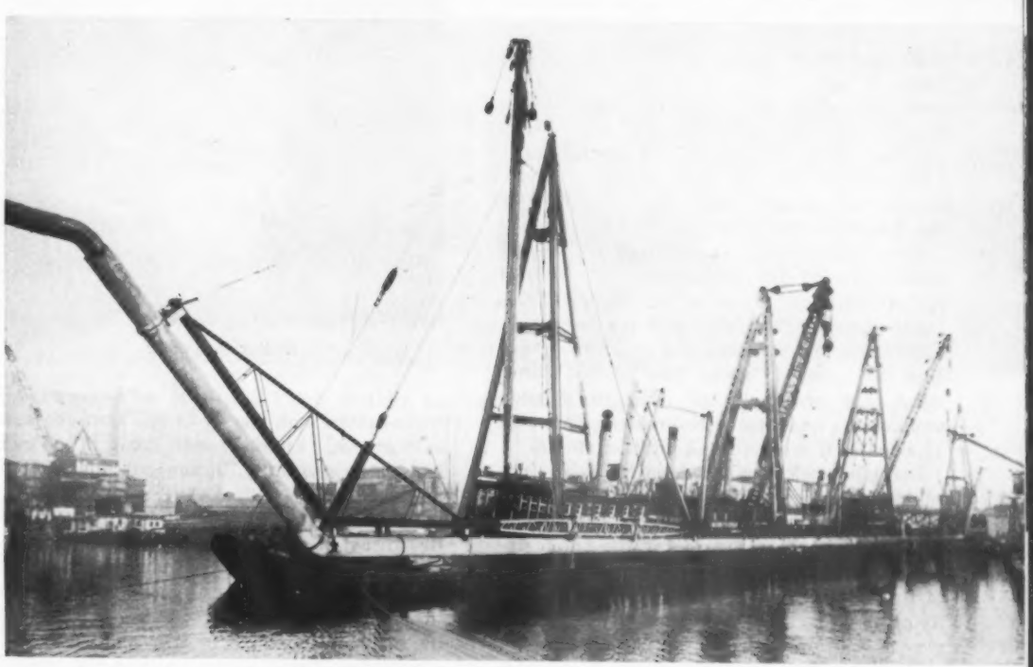
mer and discharge temperatures approaching 250°F. which would cause damage to line coatings and stresses in the line itself. Hydraulic drive for cooling the air-fin units was installed at the Maryland station and at this point no electrical generating equipment was included in the plan. Turbine driven generators were installed at most stations. To protect compressors from entrained dust and line scale particularly in the early life of the line it was decided to install oil bath type inlet gas scrubbers. Fifteen granular-desiccant dehydration plants are required to dehydrate the gas before entry into the line. Plants range in capacity from five to 30-million cubic feet daily.

The Transcontinental line is divided into a series of blocks, each approximately 17-miles in length, separated by motor operated valves. Motor drives are controlled from remote locations. In event of fire or explosion it is possible to isolate quickly the station, shut it down, and bleed all gas from piping. As an economy move all valves are welded into place.

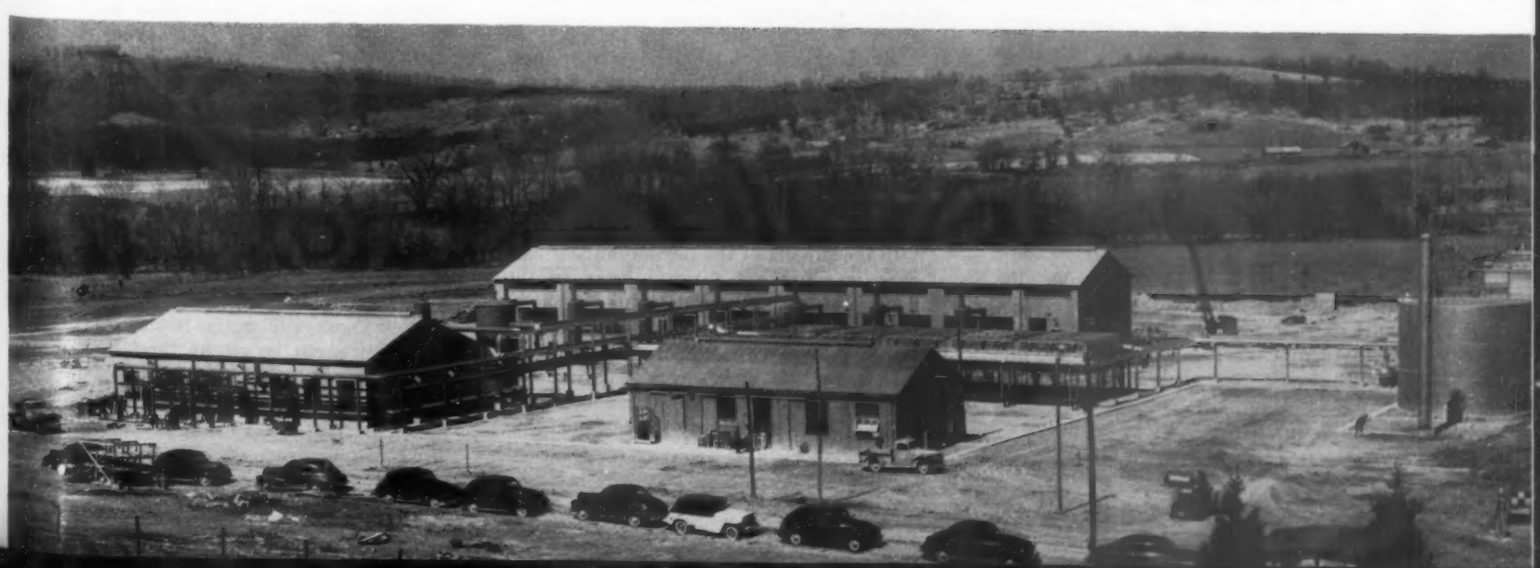
The 17-mile block system was helpful in cleaning, testing and filling the line which was done a block at a time. Each block contains 17-million cubic feet of gas when compressed to 600 psig.

Maintenance crews will be equipped with mobile radio equipment for two-way phone communication with compressor stations, the Houston dispatching station or patrol planes. The line is equipped over its entire length with a micro-wave radio communications system.

Completion of the Transcontinental line within the next few days will aid in conservation in the Southwest by minimizing the waste of gas produced with oil. It will be an important national facility in case of war because it has been built to specifications which will permit conversion to oil transport.



While the Hudson crossing was in progress, Consolidated Edison, a Transcontinental customer, was engaged in a crossing of its own. Pictured is a 567-foot section of pipe weighing 173 tons being moved into place for crossing the Harlem River. Acme photo.



Compressor station near Orange, Virginia, during course of construction. Photo courtesy Clark Brothers Co., Inc.

Walter Teagle is Awarded A. P. I. Distinguished Service Medal

Walter C. Teagle

WALTER C. TEAGLE, former president and chairman of Standard Oil Co. (N.J.), was awarded the 1950 American Petroleum Institute gold medal for distinguished achievement at the recent annual meeting at Los Angeles. Mr. Teagle, who is now in his 73rd year, was the chief executive officer of the New Jersey company for a quarter of a century beginning with World War I—the period of Standard's greatest growth. He also was one of the charter members and founders of the American Petroleum Institute in 1919.

The citation which accompanied the gold medal credited Mr. Teagle with being more responsible than any other one man in making it possible "for the industry to supply our armed forces with all the petroleum products they needed, where they needed them, when they needed them." His work made unnecessary and unwise government operation of a national resource, the citation stated.

Special mention was made of his fair-mindedness and the manner in which he exercised his great powers of decision in unwavering integrity with first regard for the public interest. His pioneering in the establishment of the eight-hour day and a high standard of living for the two million oil industry employees and his readiness to serve the government at any time, were recognized in the citation.

Mr. Teagle is the grandson of one of John D. Rockefeller's first partners and is credited with being Mr. Rockefeller's first real successor as an aggressive, far-seeing executive head of the Standard interest. Under his leadership Standard increased its daily crude production from 26,800 to 752,700 barrels daily. He expanded its refining capacity from 128,000 to 930,500 barrels daily. The New Jersey company enlarged its ocean tanker tonnage from 336,000 to 2,031,000 deadweight tons while he directed its operations.

When he was graduated from Cornell University in 1899 Mr. Teagle started in the oil business by cleaning out stills in his father's refinery at Cleveland. He went through every department of the refinery before mounting a horse-drawn tank wagon to sell kerosene and axle grease. Later he sold lubes in carload lots while traveling throughout the United States.

In 1903 Mr. Teagle was brought to 26 Broadway at New York to join the export committee of the old Standard Oil Co. and for the next seven years his travels took him throughout the world. He was made head of the export department in 1909 and while still a young man won a seat on "the big board" and a vice presidency.

When the clouds of war were gathering in 1914 Mr. Teagle was in London where he foresaw the great demands which a conflict would place on the industry. He returned to take up his residence at Toronto as president of Imperial Oil Ltd., and at once set about developing foreign sources of oil. In that year he organized International Petroleum Co. Ltd. to purchase producing properties in Peru.

With the sinking of the Lusitania the threat of war was brought directly home to the United States. A. C. Bedford, then president of the Jersey company, was called to Washington as head of the National Petroleum War Service Committee, so it was necessary to find a new administrative head for the company. Mr. Bedford was elevated to the chairmanship and Mr. Teagle recalled from Canada to become president. He was 39 in 1917 when he sat down at the desk which was to be his for the following 25 years. Previously he had promised Mrs. Teagle that he would retire at 40. Later he was to move that day ahead a good many times before he finally retired to his dogs and guns, his fishing and his supervision of the Teagle Foundation.

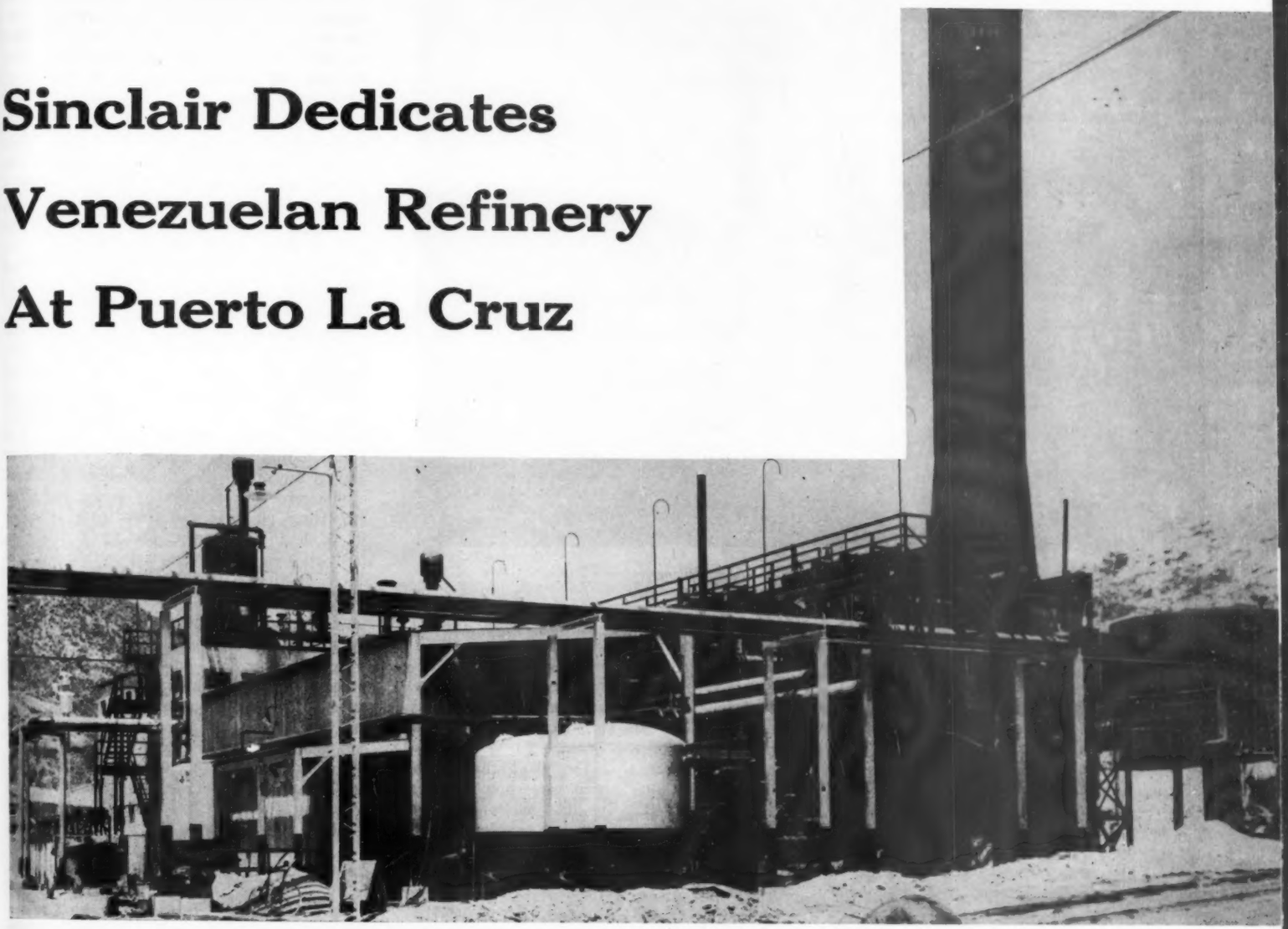
In his early years as president of the Jersey company he began expanding the tanker fleet, seeking new sources of production and enlarging refineries to meet the nation's war needs. As a result of the 1911 dissolution decree the company was no longer well-rounded and his first job was to make it a real integrated unit. So that he could be free to do this without disharmony among employees he set up voluntary collective bargaining in 1918 and thereafter never was bothered with a serious strike affecting more than one department or locality.

Under Mr. Teagle's leadership the Jersey company financed Humble Oil & Refining Co. as a potential source for domestic crude. In foreign areas he acquired Creole Petroleum Co. in Venezuela and Tropical Oil Co. in Colombia. By an exchange of stock he acquired Pan American producing properties in Venezuela and refinery at Aruba, D.W.I. The company prospected successfully in the East Indies and joined with others in Iraq Petroleum Co. operations in the Middle East.

He was drafted by the government for a number of important assignments. Included was the "share-the-work" movement during the depression. He was selected to head the National Industrial Recovery Board under the NRA. President Roosevelt made him a member of the National Defense Mediation Board and the National War Labor Board. Meanwhile, he had many other interests such as a directorship in the Federal Reserve Bank of New York and a trusteeship at Cornell.

At retirement he set up the Teagle Foundation to aid young people in obtaining a higher education. Thus far some 150 scholarships have been awarded.

Sinclair Dedicates Venezuelan Refinery At Puerto La Cruz



Boiler house and generator plant at Sinclair Oil & Refining Company's new refinery at Puerto La Cruz, Venezuela. Water treating facilities are in the foreground.

By Robert T. Brinsmade

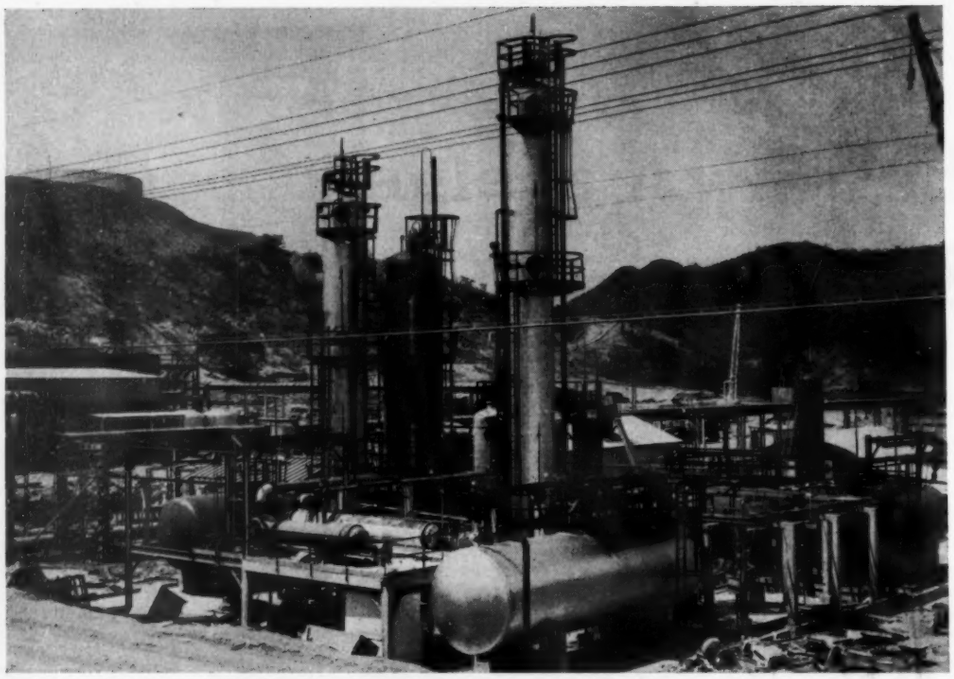
SINCLAIR Oil & Refining Co. dedicated its new 35,000-barrel refinery at Puerto La Cruz, Venezuela, on Oct. 21 in the presence of national and state officials and company officers. The refinery had actually been in operation since Oct. 1. Addition of the new plant brings refining capacity in Venezuela to 326,350 barrels daily. This is an increase of 150 percent since passage of the 1943 petroleum law when capacity aggregated 131,350 barrels. Venezuelan plants now can process about 20 percent of the nation's crude production.

The city of Puerto La Cruz has had a spectacular growth during this period of Venezuelan refinery expansion. To anyone first visiting the city, it seems but a small half-built town having a very beautiful view and a deep water harbor but no other special attraction. To those of us who have lived in Venezuela for the past ten years its growth from an almost unknown town of not more than 5,000 inhabitants to a fairly large city of more than 35,000 and one of the most important oil terminals of the Western Hemisphere is little short of miraculous. Oil and more oil, flowing out of eastern Venezuela's oilfields, finds its outlet in this natural port and harbor, and is principally responsible for the growth and present prosperity of the community.

As recently as four years ago Puerto La Cruz served only as a loading terminal for crudes going to all parts of the world. The multi-million dollar construction program commenced with the construction of Venezuelan Gulf Refining Company's refinery, built in association with the Texas Co., which was completed in Sept. 1950. Both projects represent a total investment in this area alone, of over $70-million in the relatively short period of three years.

The refinery program was stimulated, not only by the increase in production in Eastern Venezuela, but also by the requirements of the Venezuelan government. In granting new concessions under the 1943 petroleum law it was required that a certain percentage of the oil produced from new concessions be refined in Venezuela. To further encourage this refinery program, the 1943 petroleum law authorized the Federal Executive to grant numerous tax and custom duty concessions to those oil companies that established refinery facilities in Venezuela to refine Venezuelan crudes.

Thus far Creole Petroleum Corp., Shell Petroleum Co., Venezuelan Gulf Refining Co. and Sinclair Oil & Refining Co. have built refineries. The first two located their refineries in Western Venezuela and the last two, as has already been stated, in the Puerto La Cruz area. It is expected that as production increases other companies will follow their example, thus a greater amount of Venezuelan crude will be refined in Venezuela, rather than



Gasoline and kerosene treating facilities.

in the Dutch islands of Curacao and Aruba adjacent to the Venezuelan coast, where some of the largest refineries in the world have been processing Venezuelan crudes.

An interesting feature of this new refinery program is the emphasis that the Venezuelan government has put upon the necessity for satisfying domestic demands for such products as asphalt, paraffin, lubricants, etc. For this reason the Shell refinery in Punta Cardon is set up to produce lubricants, the Creole refinery in Amuay to produce special types of asphalt and more recently Phillips Oil Co. is about to complete a refinery to supply Venezuela with paraffin.

Sinclair's new plant is its only refinery outside of the continental United States. On its initial test the plant ran 37,720 barrels a day although its normal capacity will be 35,000 barrels. It is processing Santa Barbara-type crude and is producing gasoline of various grades, kerosene, heating oil and residual fuel. Markets for these products will be all over the world. Santa Barbara crude is delivered to the plant through a 100-mile pipe line which was completed by Sinclair in 1943. The line has a capacity of 50,000 barrels daily and is connected with a number of fields en route to the marine loading terminal on Chaure Bay not far from the refinery.

Considerable tankage was in place when the refinery building project was begun, the marine loading terminal being equipped with nine 80,000-barrel tanks. This has now been supplemented with crude and product storage with a capacity of more than 1,500,000 barrels. The two storage areas thus give Sinclair an effective capacity in excess of 2,200,000 barrels.

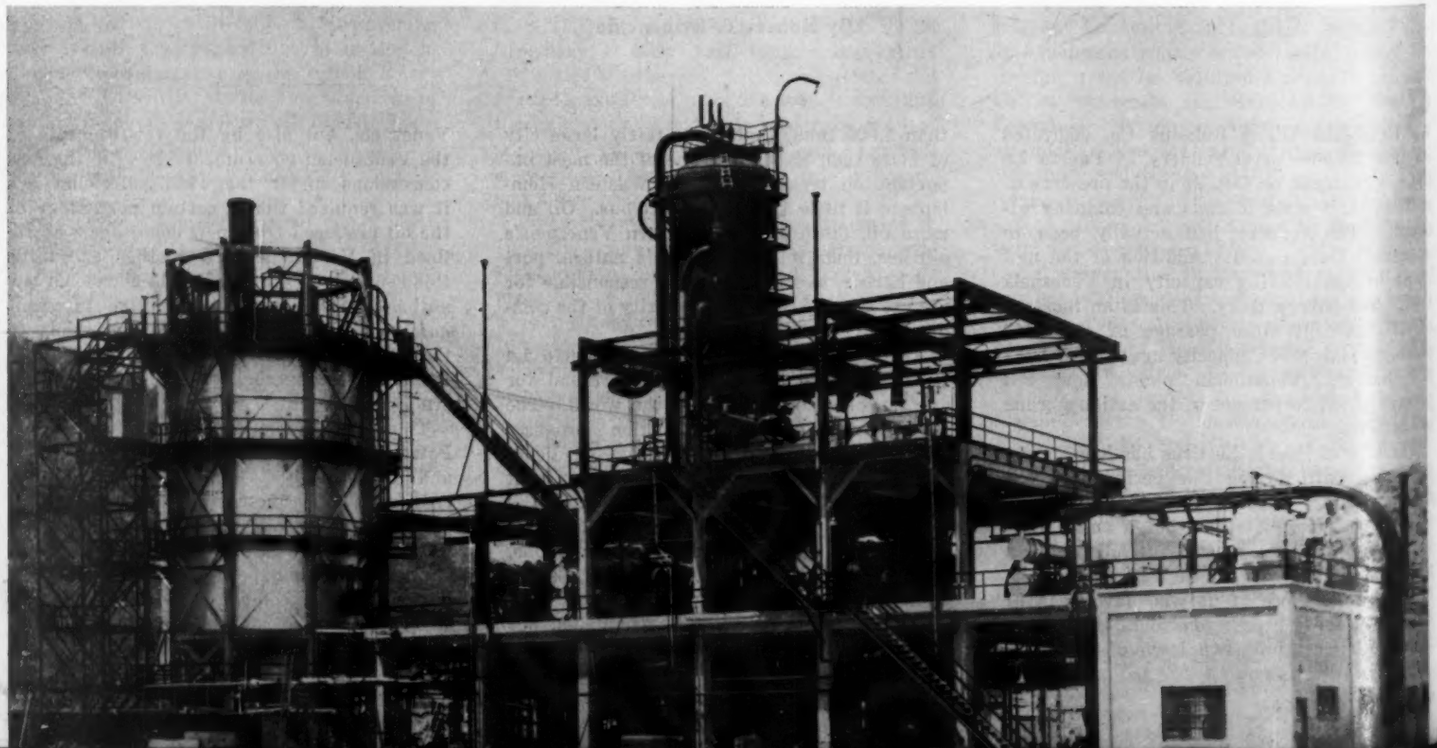
The rugged terrain available as a plant site made the construction job by no means simple for Frederick Snare Corp., engineers and general contractors, and Chicago Bridge & Iron Co., tankage contractors. Nevertheless, the plant was completed and placed in operation three months ahead of schedule. An accompanying photograph will illustrate the complexity of the site and suggest the difficulties it presented.

The refinery embraces a 35,000 barrel distillation unit, a treating plant for gasoline, kerosene and diesel oils, and an ethylizing plant. The distillation unit is of Fluor design with De Florez heater, flash tower, fractionating column, and stripping tower. The fractionating tower is nine feet in diameter and 93 feet high. A full complement of heat exchangers assures efficient operation. The ethylizing plant is the first installation of its kind in Venezuela, placing Sinclair in position to market the first nationally produced ethyl gas in that country.

Power is produced by steam turbo generators of 2700 KVA, total capacity. Normally the turbines will exhaust against 20 pounds back pressure, the exhaust being used for process steam. When the demand for process steam is low a portion of the generating capacity may be operated condensing. Steam is supplied by four 175 pound boilers with a normal output of 132,000 pounds per hour. The boiler plant is of semi-exposed type. The ten foot diameter by 190 feet high steel stack is believed to be the highest structure in Venezuela. It was welded complete on the ground and erected in one lift by the contractor.

In a location such as Puerto La Cruz, a refinery must be prepared to undertake major repairs with its own facilities. The Sinclair

Crude topping still. Condenser and exchanger decks in foreground, 35,000-barrel down-fired De Florez heater is shown at left.



plant is, therefore, exceptionally well equipped with boiler, machine, welding, carpenter and electrical shops. The large general storage warehouse is prepared to carry complete inventories of spare parts, supplies and materials.

The site did present the engineers with an opportunity which was not overlooked in the construction of an elaborate water treating system to prevent pollution of the bay with oil from the refinery waste water or ballast pumped from incoming tankers.

Three earthern basins were built in a natural ravine near the refinery area. The first, or ballast basin of 587,000 cu. ft. capacity is 26 feet above sea level; the second, a separation basin of 265,000 cu. ft. is 13 feet above sea level; and the third, a 330,000 cu. ft. guard basin, is at sea level. Upon arriving in port, ballast water from tankers is pumped into the first basin where it is allowed to settle before skimming; the discharge from this basin, as well as refinery cooling water goes into the second or separation basin. In this basin is located an API separator through which the top mixture of water and oil passes, and the oil is separated from the water and returned to the refinery. The remaining water then goes into the guard basin for settling, and if necessary, further skimming before being allowed to flow into the bay. The effluent from the basin enters the bay through submarine pipelines.

The fresh water for boilers and other refinery use, and for the domestic supply for the village, comes from a point on the Neveri River nine miles distant. The water is coagulated, settled and Zeolite filtered before storage in the 30,000 barrel supply tank.

Salt water is taken from Chaure Bay. A platform on piles was constructed over the water where the depth is 30 feet. The pumping equipment consists of four diesel engine drive centrifugal pumps with a combined capacity of 14,000 gallons per minute. A 30-inch main is carried on a trestle from the pump station some 300 feet to the shore for distribution through the salt water system.

Venezuela Refinery Capacity Before Passage of 1943 Oil Law and Today

Company and Plant Location	*Daily Capacity in Barrels* *Prior to 1943*	*Oct. 1950*
Creole Petroleum Corp.		
Caripito—Eastern Venezuela	75,000	75,000
Amuay—Western Venezuela		60,000
La Salina—Western Venezuela	12,000	12,000
	87,000	147,000
Royal Dutch Shell Group		
Cardon—Western Venezuela		60,000
San Lorenzo—Western Venezuela	40,000	40,000
Casigua—Western Venezuela	1,000	1,000
Calvario—Western Venezuela	300	300
Rivera—Western Venezuela	300	300
	41,600	101,600
Venezuelan Gulf Refining Co. (Associated with Texas group)		
Puerto La Cruz—Eastern Venezuela		30,000
Sinclair Oil & Refining Co.		
Puerto La Cruz—Eastern Venezuela		35,000
Socony Oil Co.		
Anaco—Eastern Venezuela	250	250
Silvestre—Eastern Venezuela	100	100
	350	350
Texas Petroleum Co.		
Tucupita—Eastern Venezuela		10,000
Mene Grande Oil Co.		
Cabimas—Western Venezuela	1,800	1,800
Oficina—Eastern Venezuela	400	400
	2,200	2,200
British Controlled Oilfields		
Mene De Mauroa—Western Venezuela	200	200
TOTAL	131,350	326,350

Figures furnished by the Ministry of Development in Venezuela.

What impressed the visitors most at the dedication were the extremely comfortable and up-to-date housing facilities provided for the 215 men comprising the refinery personnel. The location of these houses is most attractive. The site overlooks the bay with the mountains in the background. Eighty-four houses have been added to the residences previously built for marine terminal personnel. The new houses include 24 for staff supervisors and 60 for plant workers. An air conditioned infirmary has been built with four beds to supplement the hospital built by Sinclair in the Santa Barbara area. Besides these individual comforts, a recreational house, club facilities, commissary and laundry make for a perfect community environment and certainly for one of the most desirable places to live in Venezuela.

The plant is equipped with carpenter and machine shops, warehouse, garage, office building, laboratory, power house, pump houses and change house.

The operating superintendent of the new plant will be E. T. Lincoln who was transferred from the Santa Barbara field where he was superintendent of the repressuring plant. His assistant is J. E. House, formerly at Sinclair's Fort Worth, Texas, refinery. W. S. Gullette was the owner's representative at the site. F. J. Woodsmall was project manager for the Frederick Snare Corp.

Guests at the dedication ceremonies on Oct. 21 were flown by special plane from the Maiquetia airport serving Caracas to the Barcelona airport, closest airport to the city of Puerto La Cruz. Dr. Manuel Egana, minister of development of Venezuela, was accompanied by his administrative and technical assistants, Doctores Gustavo Tehri Fombona, director of the Department of Production; Luongo Cabello, director of the Department of Economics, and Francisco Medina, director of the Refinery and Conservation Department.

The visitors were accompanied on the plane by Edward Steinger, executive vice president of Venezuelan Petroleum Co.; Edward Mulvihill, president of Sinclair Oil & Refining Co.; John Conway of the public relations department of Sinclair Oil Corp., New York, and visiting writers. They were received at Barcelona airport by Dr. Falcon Briceno, governor of the State of Anzoategui and other state officials.

General view of refinery area. Processing installations are at the rear of the group of tanks in the middle foreground. Housing is at the base of the mountains in the background.

The European Recovery Program

by DR. O. E. BRANSKY

Chief, Petroleum Branch
Economic Cooperation Administration (ECA)

THE purpose of this article is to describe the part played by the European refinery program in the economic recovery program of Europe. The writer will also endeavor to give his impressions of European refineries gained during his recent visit and inspection of some 30 refineries in operation or under construction in various European countries.

The European recovery program was, from the beginning conceived as a four-year program. The half-way mark has now been reached and passed. What progress has been made towards the goal and achievements of this program, and in what respect has the refinery program contributed to this progress?

In the 1947 report of the Committee on European Economic Cooperation (C.E.E.C.) which formed the basis of the European Recovery Program (E.R.P.), it was stated "Europe's dollar resources are running low. One country after another is already being forced to cut down vital imports. . . . If nothing is done a catastrophe will develop as stocks become exhausted. . . . Life in Europe will become increasingly unstable and uncertain; industries will grind to a gradual halt for lack of materials and fuel."

Recognizing this desperate situation, the American people were quick to respond, and authorized billions of dollars to pay for the food, goods, materials, technical knowledge under an aid program dedicated to the economic recovery of Europe. Speed in getting this program under way and carrying it forward as rapidly as possible was vital, for there was not much time left to avoid the economic and political collapse of all Europe. The ECA was organized to carry out this program, and in April 1948 started on its great assignment.

One of the elements regarded as essential to the success of the recovery program was the recognition that a strong production effort would have to be made by the countries participating in the program. The record of achievements of these countries during the past two years shows that they have put forth stronger and stronger production efforts so that today the total output of goods, materials and services is well above that of the pre-war level and more than 25 per cent above that of 1947. The expansion of heavy industry has been exceptionally strong. Much of this success is due to the size of the capital expansion and re-equipment programs which the participating countries have been engaged in since the end of the war. The expansion of heavy industry and other segments of European industry and business has been made possible with the help of ECA funds. It has been estimated that each million dollars of aid has resulted in an expansion of annual output of approximately six million dollars, six times as much.

In this outstanding productive effort, oil has played and will continue to play a most important part. Oil can best illustrate the production efforts which Europe has made during the past two years. According to the O.E.E.C. Oil Committee, consumption of petroleum products in Europe is expected to reach in fiscal 1951 a level of more than one million barrels per day. This is nearly 70 per cent above the pre-war level. It is 33 per cent higher than in fiscal 1949, and 13 per cent higher than in 1950. Significantly, the largest increases occurred in the use of oil for industrial purposes. According to O.E.E.C., domestic consumption of fuel oil is expected to be about 296,000 barrels per day during the current fiscal year, or 84 per cent above pre-war; diesel oil is expected to reach a consumption level of 220,000 barrels per day during the current fiscal year or about 97 per cent above pre-war level.

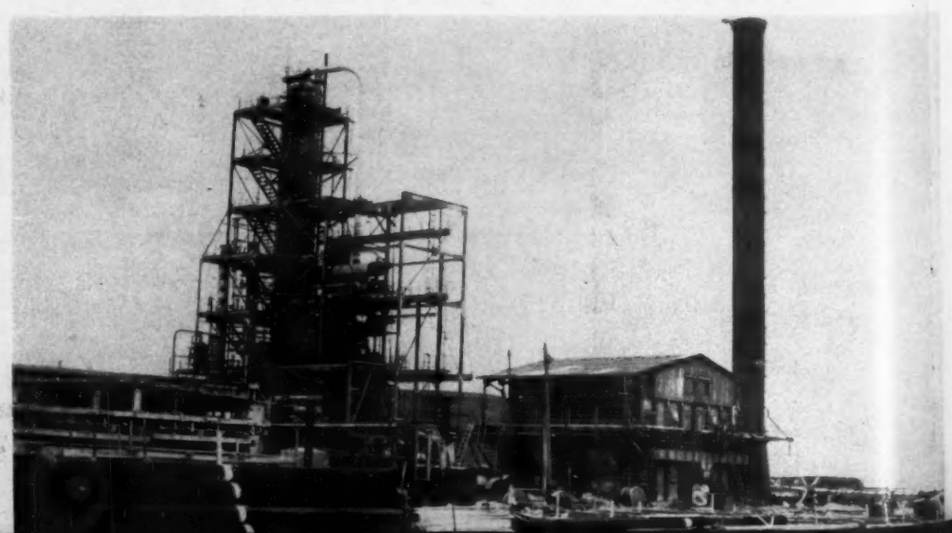
On the other hand, and to illustrate the great effort that Europe has made and will no doubt continue to make to keep down consumption of oil for non-essential purposes, it may be pointed out that during the current fiscal year the consumption of motor gasoline, even with the general relaxation of gasoline rationing, will represent an increase of only 9 per cent above the pre-war level. This small increase compares with increases of 84 per cent for fuel oil and 97 per cent for diesel oil.

It is a remarkable achievement that despite the increases in oil consumption the participating countries will spend fewer dollars for their petroleum needs during the current fiscal year than for 1949. It is estimated that the dollar cost of Europe's petroleum requirements during fiscal 1951 will be about 400 million dollars as compared with actual dollar expenditures of 614 million dollars in fiscal 1949. One of the major factors responsible for this has been the reconstruction and expansion of the European refining capacity. This has enabled Europe to refine domestically greater and greater quantities of their own product requirements from imported crude oil plus some indigenous crude oil. Millions of dollars have thereby been saved by these countries, and these savings have played a most important part in their efforts to close their dollar gap. Had Europe not been able to expand its refining capacity, it is estimated that it would have had to spend for its fiscal 1950 petroleum imports approximately 40 million dollars over and above the actual dollar expenditures.

In 1948, total European refining capacity was about 480,000 barrels per day. It is possible that this capacity will reach a total of approximately 880,000 barrels per day in fiscal 1951. The pre-war level of refining capacity in Europe was about 380,000 barrels per day. A large part of this capacity was destroyed during the war. At the end of 1947 total European refining capacity in condition to operate amounted to approximately 400,000 barrels per day.

With the cessation of hostilities, the participating countries immediately began the reconstruction of their bombed-out refineries. An amazing and truly remarkably fast job of reconstruction was done, and is still going on. When it is realized that Europe had only about 400,000 barrels per day of available refining capacity in 1947, and in less than three years will be able to restore and increase its capacity to an estimated 880,000 barrels per day, it is evident that this has been a remarkable achievement. It must be remembered that a good part of this re-

As part of the Dunkirk, France, refinery program the topping unit formerly located at Courchelette was transferred to Dunkirk and incorporated in the reconstructed plant.



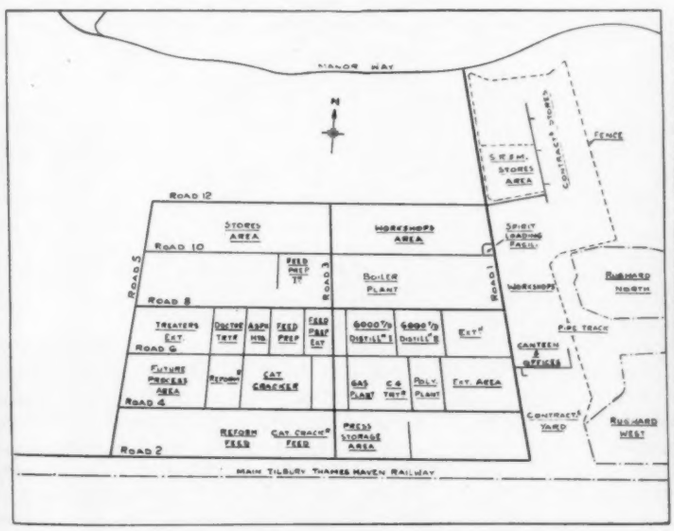
construction consisted in putting together salvaged and repaired equipment, some of which had to be brought back from distant places to which it had been carted away during the war.

Merely to restore what had been destroyed during the war and to stop there, would not have made it possible for Europe to reach its program of full recovery and economic independence within the few years allotted for this program. It was recognized that greater and faster progress towards economic independence would be made if Europe were given aid not only for reconstruction but also for modernization and expansion of industry where justified on a sound economic basis. Obviously, unless the basic raw materials were available or made available, it would be impossible to expand their production. For the expanded refineries of Europe, crude oil in sufficient supply from the great oil reserves of Middle East and from Venezuela and elsewhere is available for their full operation Europe, in its recovery program, early recognized the possibility of making substantial reductions in its total dollar requirement by importing crude oil and refining its products instead of importing them. From Europe's point of view, particularly since some European companies own a large part of the great

Ground plan of Shell Haven plant as pictured above.

Site of the Shell Refining and Marketing Co. plant at Shell Haven, England in August, 1949.

General preparatory work at the Shell Haven plant.



Middle East and Venezuelan production, it appeared natural for it to want to develop its own resources as an important part of its overall recovery program, and thereby improve its balance of trade, close the dollar gap and restore its solvency and economic independence.

ECA also recognized the value and importance to Europe of not only reconstructing but also expanding on a sound basis its refining capacity. Accordingly, ECA gave favorable consideration to those refinery projects which, in its judgment, were economically sound; could survive under competitive conditions; would not duplicate existing and available capacity elsewhere; and would not require the help of government subsidies, or the imposition of high tariff barriers or currency restrictions and discrimination to keep them from shutting down.

It was and is the clear policy of ECA that it will not help finance any increase in refining capacity unless the resulting increased output can be marketed without continued resort to currency discrimination, bilateral agreements, trade barriers, subsidies, or other such arrangements. It is essential that the increase in refining capacity should fit into the world oil structure and that available capacity outside of Europe is not being

Building intake for water supply at Shell Haven.

Gelensberg Benzin AG. plant after destruction by aerial attack.

View of Gelensberg Benzin plant since its postwar restoration.

duplicated. It is important to study carefully the location of the expanded refineries and to be sure that ample market outlets for the products exist.

With the conditions and policies set forth above as basic in its consideration of refinery projects, ECA has approved up-to-date fifteen projects. (For list of projects see accompanying table)

It will be noted in examining the tabulation that the percentage of ECA aid compared with the total cost of all of these projects is approximately 15 per cent. It should also be pointed out that the fifteen ECA-financed projects represent only about 25 per cent of the total refinery expansion as recommended by OEEC. While ECA aid has thus been relatively small compared with the total cost of the approved refinery projects, it has provided aid at the points where it counted most. Without this aid, however marginal, this expansion would not have occurred or, at least, would have been seriously retarded. One must not forget that more important than the ECA aid, given specifically and directly to the refining projects, was the vast overall ECA aid in the form of food, fuel, raw materials, etc., without which it would not have been possible for the European countries to embark on any expanded program or even on a program of reconstruction in time to avoid the terrible consequences of economic collapse.

Of the total ECA aid, amounting to $35 million, so far granted European refinery projects, approximately half represents engineering fees and services and half special equipment that is not available in Europe. The bulk of necessary equipment, steel plate and pipe, pumps, motors, compressors, etc., is being supplied by Europe. The reason for the dollar expenditures for engineering fees, etc., is that the development of new refinery technique and equipment has progressed so much farther than European refinery development that the European refiners have found it necessary to call upon American engineering firms for their technical assistance to insure the installation of modern and efficient equipment and operating technique. At the same time, European industry has done a creditable job in expanding its production of industrial equipment during the past two years, so that it now can supply practically all necessary refining equipment for the expanded refinery program, except certain specialized types of equipment for special refinery operations such as catalytic cracking.

ECA has estimated in Spring 1950 that during fiscal 1951 the participating countries will spend a total of $757 million based on present prices in all currencies for expansion of refining capacity, maintaining existing capacity and for crude oil operations. Of this total approximately $395 million will be expended on the overseas programs of European-owned oil companies. The other $362 million will be spent in Europe for expansion and modernization of refineries, for refinery maintenance and repairs, and for exploration of prospective oil structures and oil drilling activities.

Of the total cost of the petroleum program inside Europe, $74 million will represent dollar expenditures. Of this amount it is estimated American oil companies will spend about $33 million, $16 million will represent ECA financing of approved projects and miscellaneous items, and the remainder will be in the expenditure of free dollars. The dollar expenditures during fiscal 1951 will be higher than in any other fiscal year during the recovery period because of the dollar outlay on a large American-owned refinery being built in the United Kingdom.

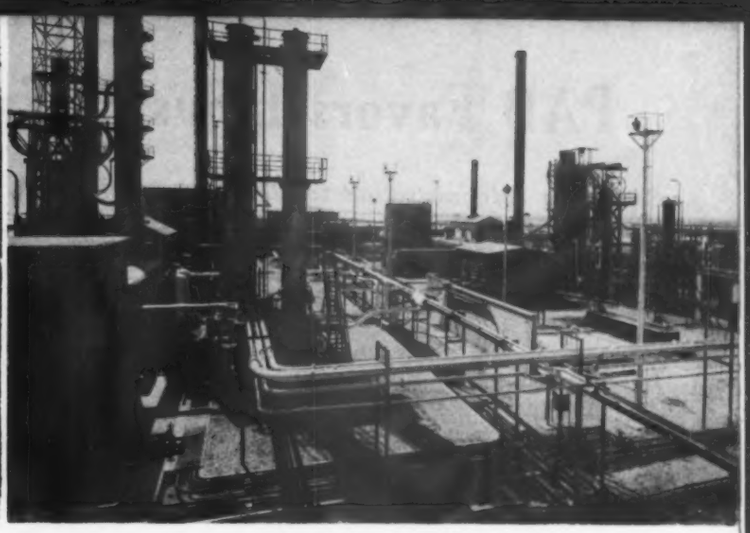
What will be the refining capacity of Europe by 1952-53? The OEEC has recently issued a report giving the results of their reassessment of the European refinery program. On the basis of this reappraisal OEEC now believes that the refining capacity of Europe in 1952-53 will be about 1.18 million barrels per day instead of the earlier estimate of 1.25 million barrels per day. Perhaps it is too early to say what effect the present military and political situation will have on the European refinery program, but it would appear that one of the effects will be to speed up the program, if materials are available. It is possible also that consideration will be given to the matter of manufacturing vital and scarce petroleum products for military needs by installing special equipment in some of the European refineries not called for in the refinery program now under way. It does not appear that the present situation will require any upward revision of the recent estimate by the OEEC Oil Committee. While ECA has not fixed any maximum level of refining capacity as a guide in its consideration of refinery projects, it believes that the revised OEEC figure of 1,180,000 barrels per day in 1952-53 is a more realistic estimate than the earlier estimate of about 1,315,000 barrels per day. In ECA's judgment there are still some proposed new refinery projects that at present appear not economically justifiable and should be cancelled or at least deferred.

Rather than fix a maximum level of refinery capacity, ECA's procedure has been and will continue to be to consider each individual project, refinery by refinery, and relate it to the existing capacity in the country making the application, to European capacity as a whole, and to the world refinery situation (outside U. S. and Russia). If the project is economically sound and will contribute to the country's industrial recovery; if it will be able to market its products without continued resort to discriminatory devices of whatever sort; and if it will not duplicate available capacity elsewhere, such a project will be given favorable consideration. ECA will not approve a project solely on the general basis that it is one of a group of projects that go to make up a pre-determined level of refining capacity in the country and in Europe. The latter basis would lead to the approval of a refinery project that may for other reasons turn out to be ill-advised, and require the continued help of governmental subsidies, trade barriers, etc., for survival.

What refining capacity Europe will reach by 1952-53 as the result of ECA's procedure of individual consideration of refinery projects cannot be predicted with certainty, but it is possible that a capacity of one million to 1.1 million barrels per day may be reached by that time. How much the military requirements for such materials as steel will affect the present estimated completion dates of the refineries now under construction is not known, but it is possible that those dates may have to be extended.

The expansion of its refineries, it should be pointed out, will not enable Europe to produce all the petroleum products that it will need in the future. It is estimated that in 1952-53 Europe will still have to import more than 300,000 barrels per day of certain special petroleum products which it will not be able to make. Some of these products, such as aviation gasoline, can be manufactured in Europe if the required special equipment is installed. Because this

Conditions existing at the cracking and reforming units at the I.R.O.M. plant before reconstruction.



Today the I.R.O.M. plant has been restored to its prewar condition.

equipment is relatively costly, the European countries have hesitated to add this additional cost to the already burdensome expenditures. The current military situation may alter their present thinking on this matter.

As pointed out frequently by Walter J. Levy, former chief of the Petroleum Branch, ECA, in his speeches and articles on ECA's operations, the dollar shortage of European countries has compelled these countries to find ways and means to reduce their dollar requirements, and they looked to oil as one of the best means to effect this reduction by building up an expanded refining industry and by developing the crude oil production to supply the increased crude requirements. Such a program, obviously, cannot be carried out without affecting the international trade of the American oil companies. Exports from the United States to Europe will become increasingly less, as Europe refines more and more of its own products. Likewise oil exports from American-owned refineries outside the United States to Europe will also be affected. While it is ECA's assignment to help Europe achieve recovery by 1952 by helping her save more and earn more dollars, there are at the same time vital national interests that must not be lost sight of, particularly in oil. It is realized that American oil industry, along with other American industries, has lost some export business and may lose more as production expands in Europe, but it is at the same time imperative that ECA be ever watchful to see that vital and legitimate interests of the United States and of American business and industry are not jeopardized and not subjected to unjust discrimination and unfair restrictions.

The writer has had the opportunity recently to visit and inspect some thirty refineries in Europe. He has seen these refineries in full operation, or in various phases of construction, and has talked to many refinery men in the various European plants. All are busily engaged in running their plants, or in collaborating with American engineers on construction. Everywhere in these plants there is a spirit of optimism, confidence, eagerness to finish the job and get the units on stream, and gratefulness for the help and generosity of ECA aid. They were extremely proud to show the writer what they had already done and what they were planning to do in the future.

It was indeed interesting to watch American engineers at work in the refineries of Europe, supervising the construction of modern refining units of American design. The new refineries of Europe when completed will look very much like the modern refineries of this country with certain exceptions. One does not see structures in the refineries of this country like the great, odd-looking cooling towers in the U.K. refineries.

The speed with which the destroyed refineries of Europe arose literally from their ashes is truly an amazing record. It would seem that as the last shot was fired, the refinery workers rushed forward without a moment's delay to clear away only enough debris to provide space and room for the reconstruction of the refinery units, tanks, etc. Large mounds of rubble and twisted steel can still be seen in some of the plants where they had been collected months before. Still can be seen overhead steel structures, bent and twisted into fantastic shapes, hanging perilously close to stills and pump houses in active operation. In some of the refineries destruction was complete. In one plant 9000 bombs were dropped by Allied bombers, 3500 of which scored direct hits on refinery equipment. In this same refinery the air raid shelter for both the operating and maintenance personnel was in the shape of a huge concrete Quonset hut, with walls ten feet thick at the bottom and seven feet at the top.

The reconstruction of refineries from salvaged and repaired equipment, and in some cases with equipment brought back to the plants from which it had been carted away to distant places, was a tremendous job. It should be remembered that all this work was done while the ashes of destruction were figuratively still hot, and the chaotic aftermath of a terrible war was at its height.

As an illustration of the frightful destruction of many of the European refineries, photographs of three of these refineries, taken before and at the end of the war, and at the present time are shown.

The U.K. refineries escaped destruction, and were able to operate during the war. There was, therefore, little or no reconstruction necessary in U.K. Its post-war efforts have been concentrated on the expansion of existing refineries, and the construction of one or two new refineries. The new and expanded refineries in U.K., as well as in other European countries, will utilize modern refining technique and equipment, and as stated before will look very much like the modern U. S. refineries. To illustrate, photographs of one of the U.K. refineries is shown.

The rapid recovery and expansion of the petroleum refining industry in Europe is an outstanding achievement, and attests to the great efforts that are being made by Europe to get back on its feet and regain its economic independence. Without ECA aid and assistance at the vital and critical points, the remarkable progress that has so far resulted from these efforts would not have been possible. It is encouraging to know that this progress is continuing, and it will be a proud day for all when ECA will make its final report to the American people that its assigned task has been successfully completed.

EUROPEAN REFINERY EXPANSION APPROVED FOR ECA-FINANCING

	Project No.	EAC Dollars	Other Amounts	Total $ Equivalent	PA's Issued (as of 9/26/50)
FRANCE					
Compagnie de Raffinage Shell Berre	30	1,850,000	29,800,000	31,650,000	1,250,000
Socony-Vacuum Francaise Grovenchon	31	850,000	5,150,000	6,000,000	877,000
Raffineries Francaise de Petrole de L'Atlantitque Donges	32	750,000	8,685,000	9,435,000	580,000
Soc. Generale des Huiles de Petroles Dunkirk	33	4,005,000	34,100,000	38,105,000	
Compagnie Francaise de Raffinage Gonfreville and La Mede	34	3,150,000	7,850,000	11,000,000	2,100,000
Compagnie Francaise de Raffinage Gonfreville and and La Mede	106[a]	2,850,000	7,150,000	10,000,000	2,850,000
Standard Francaise des Petroles Port Jerome	35	1,427,000	4,987,000	6,415,000	994,000
Standard Francaise des Petroles Port Jerome	107[a]	1,750,000	8,250,000	10,000,000	1,750,000
GERMANY					
Gewerkschaft Erdoel Raffinerie Lingen Emsland	XV	670,000	3,000,000	3,670,000	
ITALY AND TRIESTE					
Aquila S.P.A. Tecnico Industriale Aquila (Trieste)	6	4,250,000	3,700,000	7,950,000	3,859,000
Societa Permolio (Genoa, Milan and Rome) Permolio	XX	1,534,000	3,450,000	4,984,000	1,185,000
Soc. Ind. Raffinazioni Olii Minerali IROM	21	1,800,000	4,600,000	6,400,000	1,800,000
Soc. Ind. Raffinazioni Olii Minerali (1st Supp.) IROM	21[a]	550,000	1,450,000	2,000,000	
UNITED KINGDOM					
Shell Refining and Marketing Co. Shell Haven	10	2,455,000	31,545,000	34,000,000	2,199,000
National Oil Refineries Ltd. Llandarcy (Anglo-Iranian)	12	7,250,000	40,750,000	48,000,000	2,316,000
TOTAL		35,141,000	199,468,000	234,609,000	21,754,000

[a] Supplementary ECA financed projects

In addition ECA has authorized $645,000 for the financing of construction of equipment in several other European refineries. The maximum individual authorization of ECA funds for these refineries was below $250,000.

PAD Favors Industry Expansion

Petroleum Administration for Defense is Moving to Obtain Adequate Supplies of Steel and to Stimulate Drilling, Transportation and Refining.

By Joseph B. Huttlinger

Washington

A SERIES of plans for expanding the American petroleum industry at home and abroad is being worked up at Interior Department's Petroleum Institute for Defense. Expansion, rather than rationing what is available, is the government's basic method of preparing to have enough in the future to meet any emergency that may arise from the critical international situation. That situation, it is expected, may continue for years, unless it should break out into full scale warfare first.

Of top priority are steps to expand production of aviation gasoline. Some in PAD estimate the domestic refining industry will probably spend about $100 million in the next year for expansion of avgas production capacity.

Alkylate, butylenes and aromatic blending agents are critical items as regards avgas output. Under present supply conditions, the industry was able to meet a military demand of 25 million barrels of gasoline of 100 octane and higher for the six months ending December 31, 1950. Requirements for the next six months are larger than this.

While the trend is definitely toward the jet airplane, experience in Korea has indicated that the reciprocating engine airplane is not obsolete. There will be more of them, larger ones, and they will fly farther, requiring large amounts of high octane gasoline. In time, however, the jet fuel will be the big drain upon the oil industry and shift the demand to 80 octane gasoline and kerosene. The jet may use three times as much fuel per horsepower as the internal combustion plane, so that it too may pose its own special supply problem in time.

Other segments of the petroleum industry are planning growth, too. Producers have launched a campaign to get enough steel to find two barrels of new domestic oil for each barrel of production over the next four years. This means drilling at an all time high rate of 43,400 wells in 1951, a level which will be possible only if the Commerce Department allocates enough steel. Independent domestic producers would like to hold imports close to 800,000 barrels daily, but foreign subsidiaries of American companies are expected to differ with this goal. In fact, American companies with foreign operations now believe that whatever petroleum they are able to produce and deliver will find a market. This is in contrast with a year ago when the problem was to market the oil, not to find it.

The continuing search for oil elsewhere in the Western Hemisphere and the Middle East, along with construction under way, is evidence enough of the determination of companies operating in these areas to expand. Companies operating in the Western Hemisphere particularly have a go-ahead from military officials, who believe that we should build up all the reserve producing, refining and transportation capacity we can in this hemisphere. Similarly, the expansion of domestic oil pipe lines is coming in for attention, as government officials remember the need, early in the last war, for lines to carry crude oil from Texas to the East Coast. Those lines now carry natural gas, which is equally important; and there are several top executives in government and industry seriously considering the idea of building more big lines, not only to the East, but to the West Coast.

On all these expansion programs, there are statistics galore, but few of them reflect accurately just what may be expected in the coming year or two. They do add up, however, to expansion at a rate somewhat above a normal five percent a year. In fact, expansion is seen as so important, Interior Secretary Oscar Chapman made it the keynote of his speech at the American Petroleum Institute convention in Los Angeles.

To carry out any expansion program is, of course a task for the petroleum industry itself. The PAD can, conceivably, order a company to expand, requisition its plant and the like. It can put up equity capital to build plants, and advance loans for equipment and labor costs. As a practical matter, however, it must cooperate with the industry, lead it and counsel it.

Therefore, the main functions of the PAD and other government agencies for the present, seem to be to draw up long range, overall plans to guide the industry, to inform us on what may be needed in the future. Another function is to help obtain the steel and other materials, becoming ever scarcer, needed to carry on industrial operations and expansions. Another is to approve five-year amortization credits for income tax purposes on construction of an emergency nature. It well may be that the PAD, largely staffed by oil men, will prove a friend of the industry from time to time when, for instance, other government agencies launch attacks in coming years on the depletion allowance, and plump for higher corporate taxes, or excess profits taxes.

The PAD, which was created Oct. 3, with Hugh A. Stewart of Denver as acting deputy director under Secretary Chapman thus far seems an agency trying to employ a minimum of the vast, wartime, government controls voted by Congress last September in the Defense Production Act. No top PAD official has been heard to ask or suggest added government controls, nor has Secretary Chapman, who is PAD director. Barring a full scale war, chances are that a maximum of cooperation between industry and government will bring forth the production where, as and when needed.

Among its early actions, the PAD tentatively rejected an appeal of natural gas producers and transmission companies for a government agency separate from the PAD to carry out any wartime controls, including possible allocation of gas. It sought from the White House a clear ruling on whether oil men joining the government might continue receiving company salaries. It went to the Budget Bureau and asked up to $2 million next year for a staff of 300 persons, but was advised a sharp reduction is in order. It found enough aviation gasoline to meet needs of the military for current buying period, but admits the problem remains. Interior Secretary Chapman said that, although we have made considerable progress in reducing the prospective shortage for the remainder of 1950, we have not yet worked out means of completely closing the gap between production and requirements. Further, it is anticipated that average gasoline consumption will increase markedly in 1951, as mobilization proceeds.

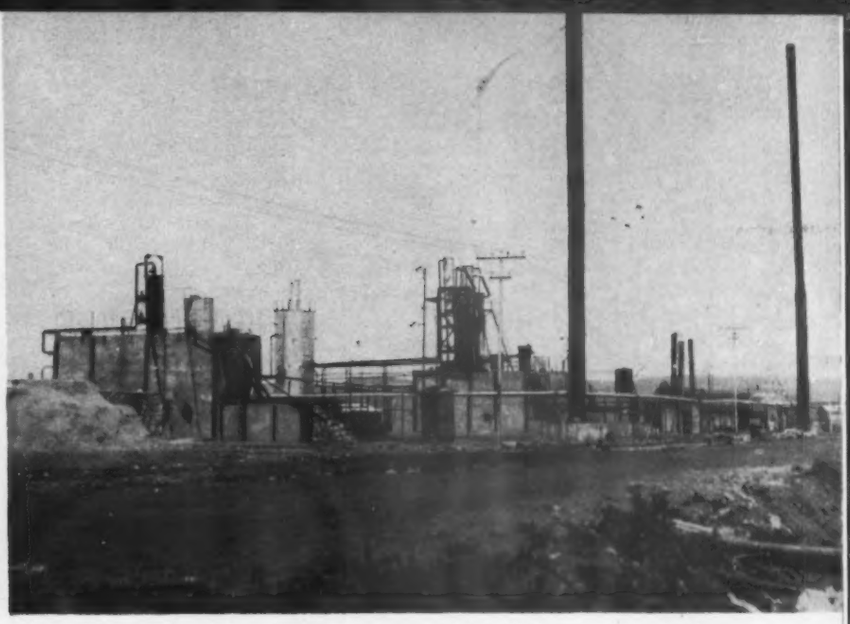
Not only Interior's PAD is working on petroleum matters. The Commerce Department's decision to license steel for export for construction of the Iraq Petroleum Co., pipeline from the Kirkuk fields in Iraq to Banias, Syria, was a major action. Protests from domestic producers and some other sources, indicate there may be further studies before additional scarce steel line pipe is permitted to go out of the country. It is understood the Commerce decision was taken without the formal approval of State and Interior and military officials who might, normally, have been asked their advice on the matter.

The Economic Cooperation Administration, which continued all year its program of helping rebuild European refining capacity, is faced with two pricing problems at this time. One is to set a proper and fair price it will pay companies operating in the Middle East for oil shipments under the ECA program to countries east of Italy. The other is to set a proper price it will pay for oil from the newly-completed Trans-Arabian pipeline being sold under the ECA program. Officials of Tapline are arguing, and ECA is expected to be understanding, that a price high enough to allow speedy amortization of the Tapline is needed. After all, they explain, the line has been built in a hazardous area at great expense.

Looming above all other issues, at this writing, is the question of steel supply for oil and other essential industry. Prospects are that demands will be so high, in the stepped up overall expansion, that full steel supply for all comers will not be available. As a result, the government will embark upon broader and ever broader allocations of steel to essential users. Danger in this is that one control leads to another, and tends to spread from steel to petroleum, and other industries. With PAD, petroleum industry leaders hope to stave off controls to a great degree. And as the months ahead bring new problems, the industry will be wise to remember that in giving an answer.

As the months ahead bring new problems, new solutions will be advanced to take care of them. Government officials appear to welcome suggestions that will contribute to expansion and growth of oil and products supplies.

General view of the Turkish government refinery at Batman.



Stills at Batman refinery with 1,000-barrel daily capacity.

Turkey's Petroleum Progress

Istanbul

By Rodger L. Simons

AS in many countries the petroleum question in Turkey is closely intertwined with problems of national policy and national finance. Despite the substantial economic progress in the past few years, the country's purchases from outside exceed her sales to foreign markets. This condition has prevailed for the past three years, whereas previously the balance, while not large, had been steadily in Turkey's favor. In contrast to prewar, the bulk of Turkish trade is with the United Kingdom and the United States, with the result that the supply of both sterling and dollars has grown increasingly short. Consequently there has been growing pressure to develop industries that will increase exports and reduce imports.

Among Turkey's imports petroleum products occupy a prominent place. In 1948 they amounted to 330,000 metric tons, being 35 percent of the total in volume, but in 1949 they rose to 447,000 tons, drawn mostly from Iran and Saudi Arabia. This being the case, the advantage of developing indigenous oil resources, if such could be found, was obvious. Private capital could have been enlisted to conduct the work of exploration, but nationalistic feeling is strong among the Turkish people, and the country's earlier experience with foreign concessions had not been a happy one. Although Turkey lacked the capital, the equipment and the know-how for the discovery and development of oil deposits, the government decided to undertake the task of employing such technical assistance as might be needed but retaining control in its own hands.

To administer exploratory operations, the Mining Research and Exploration Institute was organized in 1935. Under its direction a dozen wells were drilled in the next four years without result. In 1939 attention was directed to the Ramandag district in the extreme southeast of the country.

Five of the first tests started in the Ramandag area had to be abandoned before reaching the desired depth. Ten wells have since been drilled to completion. Three of these were later abandoned because of the presence of water, but the other seven are producing. The best of the lot has been giving a daily yield of 850 barrels, the maximum capacity of the pump working it, and the others yield about 500 barrels a day apiece. There is considerable variation in the Ramandag wells, and the Institute is frank to state that it has not been able to give them all a thorough test so far. One deep test has been drilled to obtain information as to underlying stratigraphy.

Much of the work at Ramandag at present is exploratory. As the country's refinery facilities are very limited, drilling for exploration rather than production takes up the greater part of time and attention. Thus while exploration is going on at Ramandag, exploratory drilling has been started and is well along on two new wells at Adana, in the southern part of the country near the Syrian border, one to 8,000 feet and the other to 12,000.

Drilling in Turkey is done under contract by the Drilling and Exploration Co. of Abilene, Texas, with American equipment. The company has about 25 men in the field as toolpushers and drillers. Turkish workers also take an active part in the drilling work.

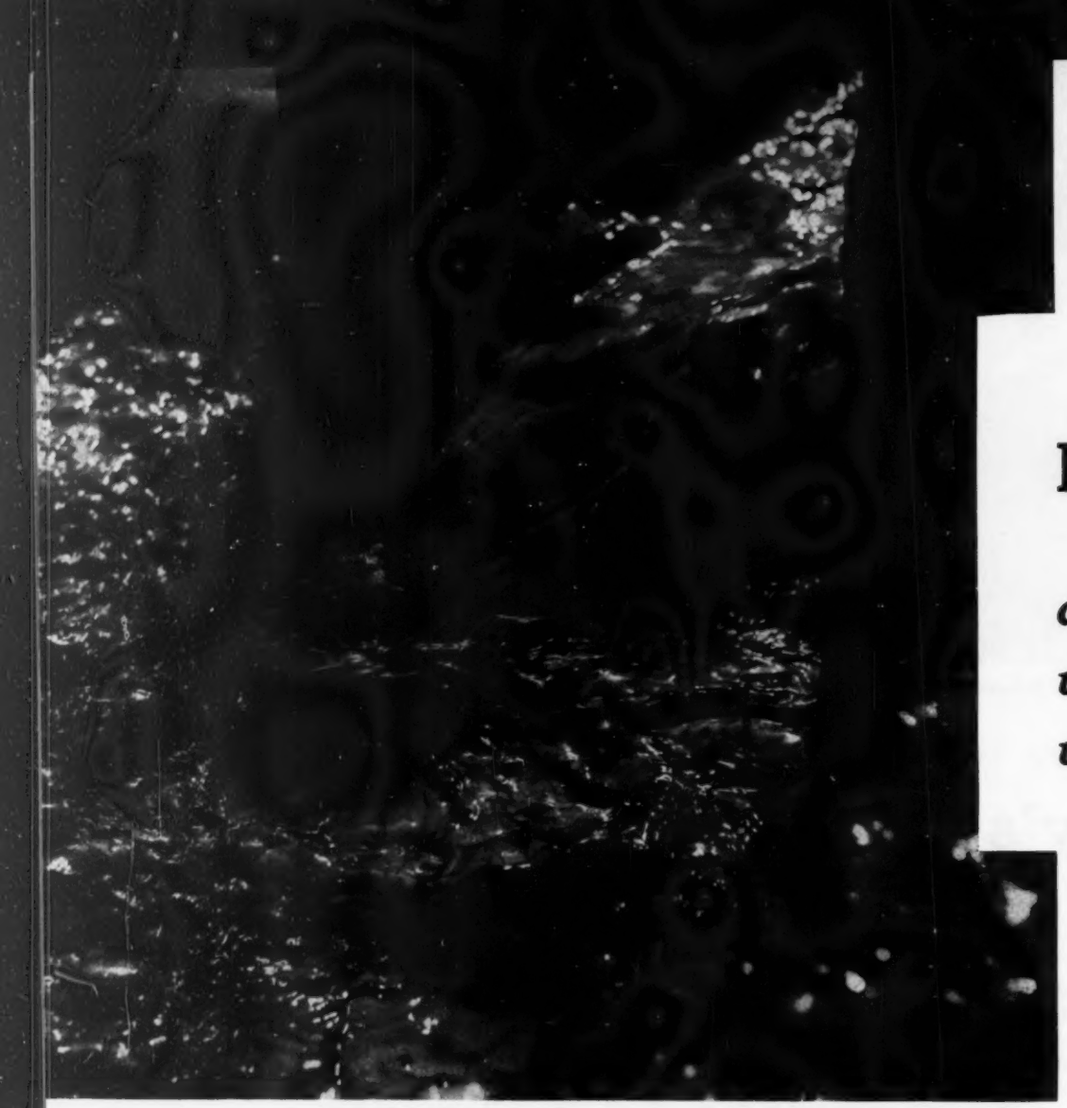
In 1948 Turkish engineers built a small pilot refinery at Batman, a village by the railroad 25 milometers from the wells, the crude being delivered to the plant in tank trucks. The daily capacity of the plant is about a thousand barrels, not a very impressive contribution toward reducing the country's dependence on imported oils. The Batman plant turns out gasoline, kerosene, diesel oil and asphalt, all consumed locally. A somewhat larger refinery, with a contemplated annual capacity of 70,000 tons, is being built.

Imports of petroleum products to Turkey during the past two years are shown as follows, in thousands of tons:

Product	1948	1949
Gasoline	141	193
Kerosene	81	111
Fuel oils	107	173
Total	329	477

(Please turn to page 66)

Turkish officials and American technicians view the oil discovery at Diyarbakir.



Drilling mud photo courtesy Standard Oil Co. (N.J.)

DEXTRAN

as a preventive of water loss in oil well drilling muds

By Dr. William L. Owen*

IN previous articles by the author[1, 2] some of the characteristics of dextran and methods for its industrial production were described. In the most recent of these articles the characteristics of some of the modified forms were described and the values given of the converted dextran in terms of viscosities and thickening potentialities, in comparison with some of the higher priced vegetable gums now imported from the Far East. It was shown that whereas pure dextran has a very low range of viscosities in its pure form, it can be modified by chemical treatment to eight to ten times its original value. Its most prominent physical characteristic is its tenacity or adhesiveness, which makes it resemble the properties of gum arabic more than those of the gums of higher viscosities, such as tragacanth, gum karaya and locust bean gums. There is an ever increasing demand for these low-priced vegetable gums in the oil well drilling industry, and in fact, the demand is so much greater than the supply that it has been impractical from an industrial standpoint to base continued operations on their use. According to Rogers[3] even the minimum requirements of the oil industry would be predicated upon the use of from 1,000 to 2,000 tons per annum, and even this amount probably would seriously demoralize the normal market prices, in view of the fact that the new demands would absorb approximately 50% of the gum suitable for the purpose, annually imported in this country.

Imports and Prices of Vegetable Gums

Gum	Tons Imported	Price Cents per Lb.
1. Arabic (also known as Sudan gum, Kordofan gum, Hashab gum, Turkey gum, Gum blanche, Senegal gum, Acacia gum)	4,500	14–15
2. Tragacanth	1,500	40
3. Karaya (also known as Indian gum or Karaya gum)	3,800	36
4. Locust bean or Tragasol gum	2,050	29–31
5. Egyptian	No data	——
6. Jungle	"	——
7. Talah	"	——
8. Ghatti	1,000	13

The function of these colloids in stabilizing drilling muds is: (1) the prevention of fluid loss in the mud; (2) the endowment of the mud with added but definitely limited viscosities; (3) the prevention of flocculation of the clay constituent of the mud by the saline constituents of sub-surface water.

The value of imported vegetable gums in the prevention of water loss is given, in descending order, by Rogers[3] as follows.

Natural pH	Saturated Salt	High pH
1. Ghatti	Ghatti	Starch A
2. Tragacanth	Tragacanth	Locust Bean
3. Locust Bean	Karaya & Jungle	Tragacanth
4. Karaya & Jungle	Locust Bean	Starch B
5. Starch A	Starch A	Ghatti
6. Egyptian	Starch B	Karaya
7. Starch B	Egyptian	Jungle
8. Arabic	Arabic	Arabic & Egyptian

It will be noted that gum ghatti ranks highest on the list in every category with the exception of high pH muds. While Rogers found that locust bean and tragacanth gave excellent results in the prevention of water loss, they unfortunately had too high viscosity values to be satisfactory for field use, while gum ghatti and modified starch gave the best results except under high pH levels.

As pointed out by Hauser[4], Dodge[5], Sawdon[6], Evans[7], and many others, a drilling fluid must be able to perform a number of specific functions, all of which are not mutually compatible. These functions include:

1. To remove the cuttings from the well as rapidly as possible. This requires high linear velocity for the mud fluid, so that the time of transit will be relatively short. (Modern equipment, high pressure steam, and large pumps are important.)

2. To hold in suspension the cuttings and prevent them from settling when the drilling

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is temporarily stopped. A mud that will do this must have certain gel characteristics, which will allow it to thicken when permitted to remain undisturbed.

3. To consolidate the loose formations often met in drillings. For this, the drilling fluid should have adequate density and the quality of building a thin, impervious tough wall in the hole to resist caving in of the formation and filling of the hole. The indirect protection afforded by a low loss of water in the filter tests retards unnecessary wetting of the formation and prevents caving or sloughing of the walls. Moreover, high hydrostatic pressure at deep levels owing to high-density mud should help mechanically to support "incompetent" (nonrigid) walls. However, the filter cake itself is protective because of its imperviousness and durability, not because of any mechanical strength as such.

4. To seal the walls of the hole, thus preventing loss of fluid phase and whole mud to the formation and conversely, by means of hydrostatic pressure, to prevent or control intrusions into the hole of high-pressure liquid or gas.

5. To act as a lubricant[8] and cooling medium for the drill stem and the bit. Thus, the mud should envelop the cuttings and sand to form a coating around them that reduces the abrasive action and corrosive effect of alkali salts on the drilling equipment.

6. To release the cuttings from the drilling fluid readily at the desired point in the cycle when it reaches the surface, so that the mud may be reconditioned without difficulty before being pumped down the hole again. (The shale shaker is used where mud problems are at all difficult and has removed the early-day preoccupation with this point.)

Other specific qualities of the mud that would make it an ideal drilling fluid require that it should be: (1) easily pumped without too great expense for power; (2) a stable colloidal mud suspension that will not separate on standing; (3) flexible in composition, so that any one physical property of the mud can be varied without changing the other properties excessively, and at the same time be independent of outside influence, such as temperature, and the flocculating action of salt water.

The value of a gum as a retarding agent in the prevention of water loss in oil well drilling muds may be indicated from experimental data obtained from ordinary laboratory filtration through paper filters, for while the results cannot be translated into actual values for field operations, the relative rate of water loss between two solutions of equal concentrations of different gums in laboratory filtrations should be parallel with these obtained from actual field conditions. In other words, the gum giving the greatest retardation of filtration through paper filters should prove superior also in actual mud operations. This, of course, applies to normal ranges of pH and saline concentrations, for the results may be quite different in high saline substrates.

The modified dextran which we have had under investigation was prepared by a series of pretreatments of the culture before precipitation from the substrate by ethyl or isoprophyl alcohol. This treatment consisted of a primary aldehydization of the culture, followed by acidification of the culture before precipitation with alcohol. The material when dried is a granular product, fairly hygroscopic, but upon moistening it becomes exceedingly sticky and mucilaginous. The following results on filtration rates of a one per cent water solution show the comparative values of this modified dextran and gum ghatti.

Filtration Rate CC. Throughout

Gum	Pct. Conc	Time 24 hrs.	Time 48 hrs.
Ghatti	1.0	52	52
Dextran	1.0 (special)	30	30

C. M. C.	Time 24 hrs.	Time 48 hrs.	Time 72 hrs.
C. M. C. 1%	30	30	
Powdered dextran.	22	24	24

After the filtration had been completed, the same filters were fed 100 cc. portions of water, to determine the degree to which each of the gum solutions had tended to render the paper impervious to the passage of water. The results of this second run are given in the following table:

Filtration Used on Gum	Filtration Rate 2 hrs.	24 hrs.	72 hrs.
Dextran	17	31	31
Ghatti	35	72	72

Filtration Rate Second Addition of 100 CC. of Water

Filtration Used on Gum	Filtration Rate, CC's 2 hrs.	24 hrs.	72 hrs.
Dextran	10	23	23
Ghatti	93	100	

It will be seen from these results that modified dextran not only greatly retards water loss on filtration but, to an even greater extent, renders the filter membrane impermeable to further water seepage.

The effect of drying upon the filtration rate of solutions of modified dextran may be seen from the following data on rate of filtration of one percent solutions of samples dried to various degrees. The highest moisture content of the least dried samples was not more than 20%, and the lowest of the driest samples was not over 13%. The filtration rates of one percent solution of these samples are as follows:

Sample—	1	2	3
Deg. of dryness	30%	66%	Powdered
Concentration, %	1.0	1.0	1.0
Filtration rate—			
2 hrs.	28	15	7
4 hrs.	40	33	15
24 hrs.	70	57	34
48 hrs.	..	..	44

The above percentages of dryness refer to the moisture content of the commercial gums, which are usually within the range of 13-15%. It appears evident from the above and from our many tests of similar products that the increased resistance of the product to filtration after drying is the result of a change in the colloidal nature of the product and is not due merely to the concentration of the solids on loss of moisture.

One of the materials widely used in oil well drilling muds is a specially prepared starch which exercises some of the properties of the vegetable gums. In order to compare Viscoba (dextran) and this type of starch one percent water solutions were prepared and their filtration rate evaluated. The results are given in the following table:

Sample—	Viscoba	Starch
Concentration, %	1.0	
Water loss in cc.—		
2 hrs.	8	100
4 hrs.	9	..
8 hrs.	11	..
24 hrs.	20	..
48 hrs.	20	..
72 hrs.	20	..

Comparative Filtration Rates of Viscoba and Starch in one percent concentrations on high Hp solutions.—One of the greatest demands for starch in the oil well drilling fields is on high pH muds, where it serves to prevent excessive losses and retard the disintegration of the drill cores. A comparative test of Viscoba and starch in aqueous solutions at pH 9 is given in the table below:

Sample—	Viscoba	Starch	Viscoba
Concentration, %	1.0	1.0	1.0*
Loss in Throughput, cc.—			
2 hrs.	10	80	8
4 hrs.	22	100	9
24 hrs.	23	..	11
48 hrs.	23	..	20

* At pH 7.0.

It will be seen from the above figures that while the filtration rate of starch is somewhat lower at a pH of 9 than at one of 7 as shown in the previous table, it is far lower in retarding value at both pH levels than is Viscoba (dextran) gum at equal concentrations. One of the great disadvantages of all natural gums, and even more so of starch, is its susceptibility to deterioration as a result of fermentation, for strangely enough all drilling muds, in spite of the high concentrations of chemicals used, are susceptible to microbial action.

We have previously referred to the observations of Rogers, that of all the vegetable gums that might be used industrially in the conditioning muds, gum ghatti appears most suitable owing to its low viscosities at concentration levels where it exercises a pronounced inhibition of water losses. Others of the natural gums have too high viscosities, even at low concentrations, and on that account are unsuitable for the purpose even though they markedly inhibit the loss of water from the mud during drilling operations under saline conditions. Gum dextran of the modified form has even lower viscosities than gum ghatti at concentrations in which these additives are utilized in the oil field, and hence, should prove of great value in the industry, on that basis as well as on the larger potential supplies available for the purpose. Comparative viscosities of modified dextran (Viscoba) and gum ghatti are given in the following table.

Pct. Conc.	Gum	Viscosity cpS
1	Ghatti	20
1	Viscoba	10
5	Ghatti	1900
3	Ghatti	185
3	Viscoba	760 (powder)
5	Viscoba	7100

At higher concentrations Viscoba gum exceeds ghatti in viscosity. The above powdered Viscoba gave the following filtrations rates at 2 hrs., 5; at 4 hrs., 10; at 8 hrs., 12; at 24 hrs., 13; at 48 hrs., 14; at 72 hrs., 14 cc. throughput.

Another valuable criterion of the applicability of a colloidal material to meet the requirements of an additive to oil well drilling muds for the prevention of water loss during

drilling operation is its stability in saline solutions, for it is chiefly as a protection against the peptizing action of salt water that the use of gums is ever indicated. In order to test the resistance of Viscoba gum to salt solutions, the following experiment was conducted. One percent concentrations of Viscoba and five percent saline solutions, respectively, were made in distilled water and the filtration rate was determined, with the results given in the following table:

	Viscoba	5% Salt solution
Concentration, %	1.0	1.0
Filtration rate—		
2 hrs.	5	7
4 hrs.	11	13
8 hrs.	15	20
24 hrs.	22	34

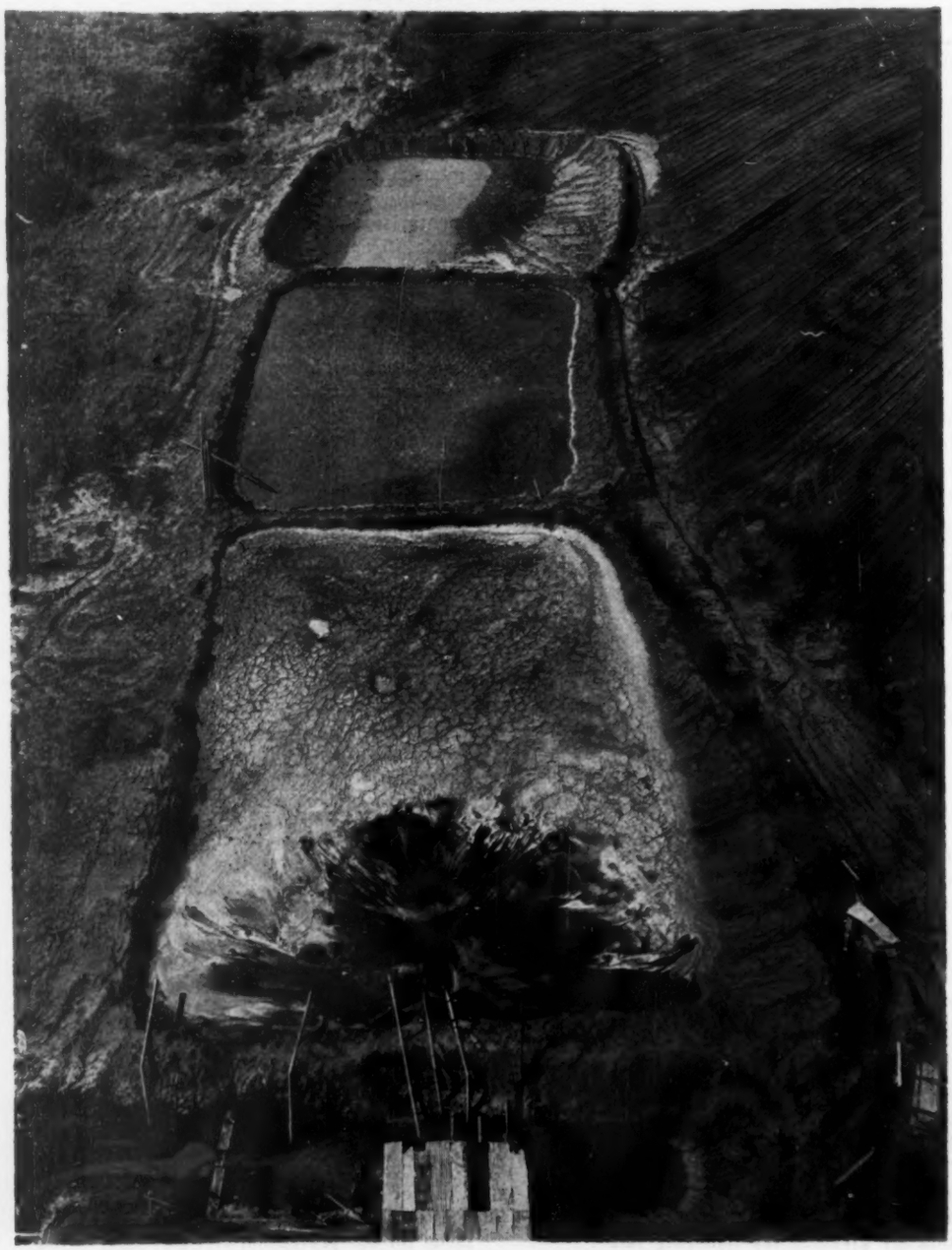
The grade of Viscoba used in all of the above tests was a crude material prepared from dehydrated cultures and hence carried most of the impurities therein contained, consisting of considerable residual sugars, as well as ash contaminants. It is unlike the purified product of high viscosities described in our earlier articles. The fact that the lower grade of dextran, as well as the purified product, have properties that enable them to compete with the high and low priced imported vegetable gums suggests one of the largest undeveloped fields for sugar utilization. By converting sugar into the two grades of dextran, and utilizing off-grade production into the material suitable and in demand for the oil well drilling field, the manufacture of Viscoba gum seems one of the most promising outlets for surplus sugar in the future. For it must be remembered that, as yet, no natural vegetable gum is produced in sufficient amount to satisfy the potential demand by the oil well drilling industry.

Comparisons of Rate of Filtration between one percent solutions of pure Dextran and the chemically modified product (Viscoba).— In our previous article on dextran[9] we pointed out that whereas pure dextran precipitated and reprecipitated from its cultures has almost negligible viscosities in comparison with the chemically modified product, we have found that the pure product also has negligible effect upon the retardation of filtration rate when used in concentrations of one percent. In the following table are given some of the comparative values of one percent concentrations of pure dextran and the chemically modified product.

	Pure Dextran	Chemically modified (Viscoba)
Concentration, %	1.0	1.0
Filtration rate, cc.—		
2 hrs.	100	8
8 hrs.	..	11
24 hrs.	..	20
48 hrs.	..	20

It is obvious in the light of the enormous tonnages of vegetable gums or other water-loss retarding agents required in the oil well drilling industry, that there are few sources of raw material that are adequate for its supply. Only the sugar and the corn products industries are sufficiently extensive to fill the demand, and since the value of starch is so inferior to that of modified dextran as a retarding agent, and since it can hardly be regarded as a complete substitute for the natural gums, the potential market for modified dextran is almost unlimited. Its manufacture could readily absorb several thousand tons of sugar or the juice of surplus cane in the tropics.

Reserve water pits and mud pits of Carter Oil Co. well in McClain County, Okla. Photo by Corsini for Standard Oil Co. (N.J.)



Conclusions

(1) Gum dextran can be converted into a low viscosity highly tenacious product, which has a very marked characteristic as a retarding agent on filtration rate of aqueous solutions. (2) This property places it on a competitive basis with some of the imported vegetable gums, particularly gum ghatti, to which it has been proved superior as a preventive of water loss on filtration. (3) Since retardation of water loss in oil well drilling operations in saline strata is a highly valuable property, and greatly sought for, any retarding agent that can be produced in thousands of tons as a minimum and at a cost competitive with the natural gums, would find an immediate market. (4) This potential market for modified dextran produced from sugar or cane juice might prove to be the greatest outlet for surplus sugar that has yet been developed in the industrial field.

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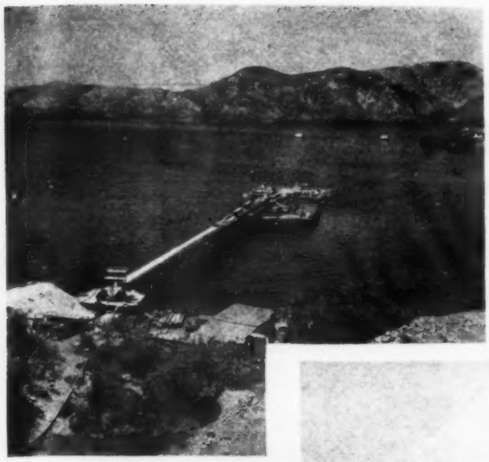

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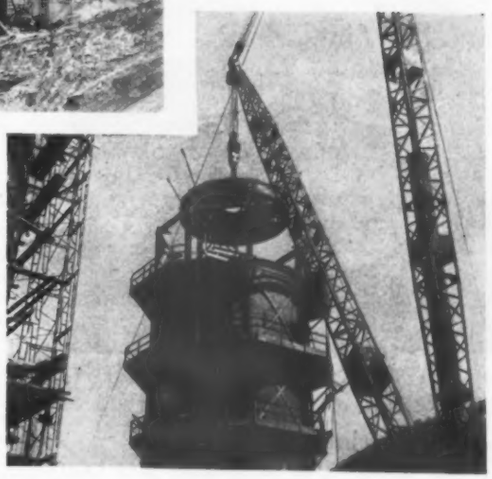

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International news and notes

Study Pacific Coast Market

Reports from Western Canada indicate that an oil pipeline from Alberta to the Pacific Coast is being considered by Imperial Oil, Ltd. Speaking to the Canadian Club in Calgary, G. L. Stewart, Imperial president, said that a market for Alberta oil in the Pacfic Coast area has been under study for some time but that the line would not be economical without selling also in Washington and Oregon.

In his address Mr. Stewart said, the availability in this area of crude oil at an economic cost should be a stimulus for additional refining construction. Such a pipeline movement would give Canadian crude access to the Vancouver area which is now inaccessible because of high transport costs. He pointed out that the Pacific Northwest has been traditionally dependent on California crude and largely on California refining capacity. There are, he said, only 30,000 barrels daily of refining capacity compared to a demand of over 250,000 barrels per day.

John Lamb

Marine Gas Turbine

A gas turbine is to be installed in a Shell tanker to replace oil engines according to a recent statement in a B.B.C. broadcast by John Lamb, head of the marine research and development department of Anglo-Saxon Petroleum Co. Ltd. The 12,000-ton Auris will be used for the experiment. At present the vessel is powered with four oil engines. For the experiment only one will be removed and replaced with a 1,200 hp gas turbine. Remaining oil engines will be kept in place for the present.

Scandinavian Demand Higher

Consumption of petroleum and products in Sweden rose 47.3 percent in the first half of 1950 compared with the same period in 1949. In neighboring Norway the increase was 8.7 percent. Swedish consumption averaged 74,700 barrels daily in the first six months compared with 50,700 barrels daily in 1949 while Norwegian consumption averaged 28,600 barrels as compared with 26,300 barrels the previous year.

The very large increase in oil demand in Sweden was encountered in both light and heavy oils. High prices for coal encouraged conversion to fuel oil and the withdrawal of rationing permitted greater automotive consumption.

Clark Licenses Alley & MacLellan

Clark Bros. Co., Inc. announces the licensing of Alley & MacLellan Ltd. to manufacture the Clark line of right angle compressors in Scotland. This licensing agreement will permit increased use of Clark units in Sterling territories. Production is now under way with completion of the first unit scheduled for early 1951.

Alley & MacLellan Ltd. of Palmodie, Glasgow, Scotland has long been a manufacturer of air compressors. Sales and service of the right angle compressors will be through Clark Bros. Co., Inc. Ling House, Dominion St., London E.C. 2, England, managed by M. J. Galpin.

To Cut Gasoline Prices

British Columbia's Coal and Petroleum Commissioner, Dr. W. A. Carrothers, has announced that gasoline prices in B.C. will be reduced as a result of the rise in price of the Canadian dollar. Oil companies were allowed a cent and one-half increase in the price of gasoline when the dollar was devalued 10 percent to compensate for the extra cost of importing gas from the United States.

New Cardiff Manager

G. & J. Weir, Ltd., Glasgow, has appointed Forrest T. Randell as manager of its Cardiff office and representative in South Wales and the West of England to succeed the late F. C. Williams. Mr. Randell is already well known in the district, having been Mr. William's principal assistant for some years.

To Build Processing Plant In Chile

Hudson Engineering Corp. of Houston has been engaged by the Chilean government to build a $3-million oil and gas processing plant to be erected south of the Straits of Magellan on the island of Tierra del Fuego almost 80 miles south of Punta Arenas, the southernmost city in the world. The plant will process gas and crude oil from the Spring Hill field, the first oil or gas field developed in Chile. The discovery well was brought in in December 1945. Subsequent development has resulted in the completion of approximately 40 wells.

The plant will process 30-million cubic feet of gas and 6,000 barrels crude oil daily. Butane and heavier hydrocarbons will be extracted from the gas, and the stripped gas will be returned to the reservoir to minimize pressure decline. The light fractions which, through evaporation, would cause crude oil loss during tanker transportation will be stripped from the crude oil, and the stable liquid hydrocarbons extracted from the gas will be blended with the stripped crude.

The Hudson company has been engaged by Corporacion de Fomento de la Produccion, a division of the Chilean government to develop process and mechanical design of the plant, to assist in the purchase of equipment, and to supervise the construction at Tierra del Fuego. It is expected that the plant will be placed in operation in June 1951.

Mexican Gulf To Sell

The Mexican Gulf Oil Co., only foreign oil producer still operating independently in Mexico, will be purchased by Petroleos Mexicanos as soon as evaluation and inventory of the company's properties are completed. Sale of the company, which was not included in the Mexican expropriation decree of March 18, 1938, is expected to take place in December.

William B. Brown

Brown Heads Esso Caribbean

William B. Brown has been elected president of Esso Standard Oil (Caribbean) S.A. to succeed R. C. Horne who recently became vice president and general sales manager of Esso Sociedad Anonima Petrolera Argentina, Jersey Standard's principal marketing affiliate in Argentina. Esso Caribbean operates in the Dominican Republic Haiti, Jamaica, the Bahamas and Bermuda, with headquarters in Ciudad Trujillo, the capital of the Dominican Republic. Mr. Brown joined the Esso organization in 1931 and in 1943 became a regional manager for the Standard Oil Co. of Brazil with headquarters in Sao Paulo and the following year he was elected a director of Standard Oil Co. (Chile) S.A.C. In 1946, Mr. Brown returned to the United States and has since been associated with the public relations department of Standard Oil Co. as liaison head for public relations with affiliated companies.

Push Pemex Building

Petroleos Mexicanos' multi-million dollar plan for rehabilitation of its present facilities is being pushed ahead at full speed, according to Pemex officials. One of the first steps was brought to a successful conclusion with renovation of the former Huasteca Petroleum Company's refinery at Mata Redonda. The new equipment, which includes a catalytic-cracking unit, heating, cooling and distillation systems and total replacement of pipe, increases the refinery's capacity from 6,000 to 17,000 barrels of crude daily.

Another line in the chain is enlargement and modernization of the Poza Rica refinery, which is expected to be finished by December. The Poza Rica gas treating plant will include a unit for the large-scale production of sulfur, and will permit a large increase in natural gas output. Three other projects close to completion are installation of a 1,502,890-dollar desulfurizing unit at the Ciudad Madero refinery, construction of a refinery at Reynosa with a capacity of 5,000 barrels daily and Latin America's largest lubricant plant at Arbol Grande.

Plans have been completed for the gas pipeline linking Poza Rica with Reynosa. It will cost about $30-million and will be 687 miles long. Work has already been started on the 180-mile line from Monterrey to Torreon, and on gas lines from the Brazil field to Matamoros and Mision which will hook up with the pipe leading from San Pedro de Roma to Monterrey.

Piped Aboard!

Oil from Anglo-Iranian's Middle East wells has a long journey—wherever it is going. The photograph on the right shows a difficult stretch in Anglo-Iranian's 1,700 miles of pipelines between the fields and the coast. On the left is a view of the main oil loading jetty at Kuwait on the Persian Gulf, believed to be the biggest in the world.

Some 14 per cent. of the world's tanker tonnage is directly employed in Anglo-Iranian's trade. Anglo-Iranian's own tanker fleet, operated by the British Tanker Company, comprises 134 ships totalling 1,600,000 d.w. tons, and the Company has vessels under charter to the extent of a further 2,000,000 tons.

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oil producers in the Middle East since 1912, Anglo-Iranian Oil Company and its associated companies also operate twelve refineries in Europe, Middle East and Australia; their sales organisation includes major marketing or supply interests in Europe, Asia, Africa and Australasia, with international ships' bunkering and aviation services.

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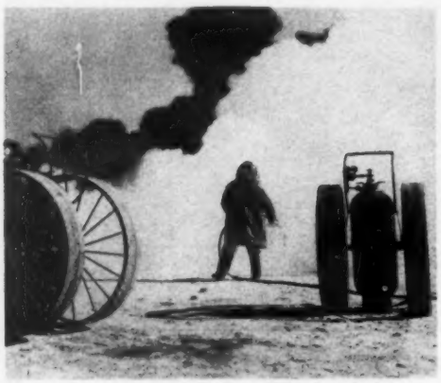
U.K. Oil Search Yields By-Product

A by-product of the Darcy Exploration Co.'s search for oil in Great Britain has been the large amount of information, which has been gathered from the geological and geophysical surveys, as well as the exploratory drilling. One of these discoveries, which is of major importance, is that of a substantial deposit of potash salts at Eskdale in Yorkshire, when testing the possibilities of gas and oil in the Permian, by drilling a 5040 foot well, which gave a gas production of nearly pure methane, at 2.5 million cubic feet per day.

At the request of the Mineral Resources Committee of the Ministry of Fuel and Power, Imperial Chemical Industries and Fisons Ltd., both of the companies have investigated the deposits and confirmed their importance.

Alberta Gas Moves Westward

Dawson Creek is the first village in British Columbia to heat its homes with natural gas pumped from Alberta through an 18-mile pipeline just completed. The line was constructed by the Westcoast Transmission Company, one of the companies seeking a permit to ship Alberta natural gas to the Pacific Coast.



Fighting oil well fire in Venezuela with dry chemical units.

Dry Chemicals Kill Well Fire

The use of dry chemicals in combatting an oil well fire in Venezuela recently was reported by Walter Bitterling, distributor for Ansul Chemical Co. in Venezuela. The fire was extinguished in one minute with four 150-pound units after proper preparations had been made.

The well which caught fire was a dual completion producing through both casing and tubing. At the time of the blaze the tubing was closed in with a pressure of about 2,000 psi. Casing flowing pressure was 1,250 psi with a gas oil ratio of 6,600 cubic feet per barrel.

When the fire was discovered at least two and possibly three of the half-inch test valves were open and supplying fuel. Master valve and valve on casing outlet were open. Flames were shooting 25 to 50 feet from the wellhead and 10 to 20 feet high. First effort to control the blaze was an attempt to close the master valve with an extension handle but the master wheel twisted off. Next chemicals were tried. Two 150-pound dry powder units and four 40-gallon foam extinguishers with two water streams were tried simultaneously. After this failure four more 150-pound Ansuls were brought from another location and placed on the windward side. These almost extinguished the fire but it flashed back when the units were exhausted. Foam was played continuously on the fire to prevent a ground fire and flash back but it had no effect on the well fire.

The five 150-pound Ansul units were refilled and opened simultaneously. Within one minute the fire was completely out and water was redirected to the well head and on workers who went in to tighten the flange and replace flange bolts. Once this was done and valves closed the well was killed by pumping in mud. The fighters concluded that in a fire of this sort a water stream tended to disrupt the dry powder blanket and that it should be used in such instances only as a cooling agent.

R. N. Brunt Appointment

R. N. Brunt, until recently general manager of Burmah-Shell Oil Storage and Distributing Co. of Pakistan, has been placed in charge of Shell operations in Japan, the Philippines, Australia and New Zealand. Later he will have charge of China. In the realignment in the far east H. H. Sturt retains management of Malaya, Indo-China and Indonesia and L. W. Harford of West Africa.

Mr. Brunt entered the oil industry in India in 1922. After service at various points he became assistant branch manager at Delhi in 1933 and assistant general manager for India at Bombay in 1946. When the separate Pakistan company was formed in 1949 he became general manager. For his services to the government as advisor on oil matters he received the award of the C.B.E. in 1947.

Aids Mexican Students

Geophysical Service, Inc. of Dallas, Texas, is financing two years of graduate study at the Colorado School of Mines by Mexican petroleum engineers Andres Ramirez Barrera and Carlos Castillo Tejero. On receiving their MS in geophysical engineering, the students will return to Mexico to work for Petroleos Mexicanos.

Socony-Vacuum Sales Meeting

Fifty sales representatives in Mexico of the Compania Commercial Vacuum, S.A. (Socony-Vacuum Oil's Mexican branch) attended the 12-day training course in scientific lubrication given recently at the company's Mexico City headquarters. Purpose of the courses was to familiarize sales representatives with the benefits of proper lubrication to Mexican industry. The event closed with a banquet at Mexico City's University Club, tendered by Albert E. Blair, president, and Antonio Carbajal, general sales manager, of the company in Mexico.

Wins Employee Suit

The Mexican-American Independent Oil Co., holder of a Pemex contract for drilling in the state of Campeche, came off winner in a recent Mexican Supreme Court decision that made legal history. Mexican-American Independent had been hauled before the Federal Conciliation and Arbitration Board by Everett K. Burger, a former employee, who demanded indemnity for being "unjustly dismissed" from the firm's employ although he admitted it was he who had left the job. The board rejected his claim but Burger resorted to the unusual legal maneuver, believed the first of its kind in Mexican court history, of asking the Supreme Court for an injunction against the board's decision. The court threw out his petition, however, on the ground it had not been filed within the 15 days required by Mexican law.

Middle East Strategy

Discussion of the strategic position of the Middle East by Major John D. Cooper, U. S. Marine Corps Reserve, was the highlight of the October meeting of the Los Angeles Chapter of Nomads. A graduate in political science from Stanford University in 1941 and instructor in military intelligence after the war, Major Cooper also taught other subjects which have to do with U. S. relations with the Soviet Union. He later was assigned for some time to an intelligence unit dealing with Europe and the Persian Gulf.

Major Cooper said that the Persian Gulf provides a waterway that goes deeply into Russia and provides the closest point from which the industrial power of the Soviet might be reached by bombers. This fact, plus the very vital oil reserves and refining activity existing in the area, serves to point up the importance of the Middle East. The oil reserves are vitally important for they serve to maintain the industrial capacity of Europe. In the event of an invasion it is of utmost importance that facilities and techniques be available at all times with which wells and refineries could be knocked out as to prevent their falling intact into enemy hands, he said.

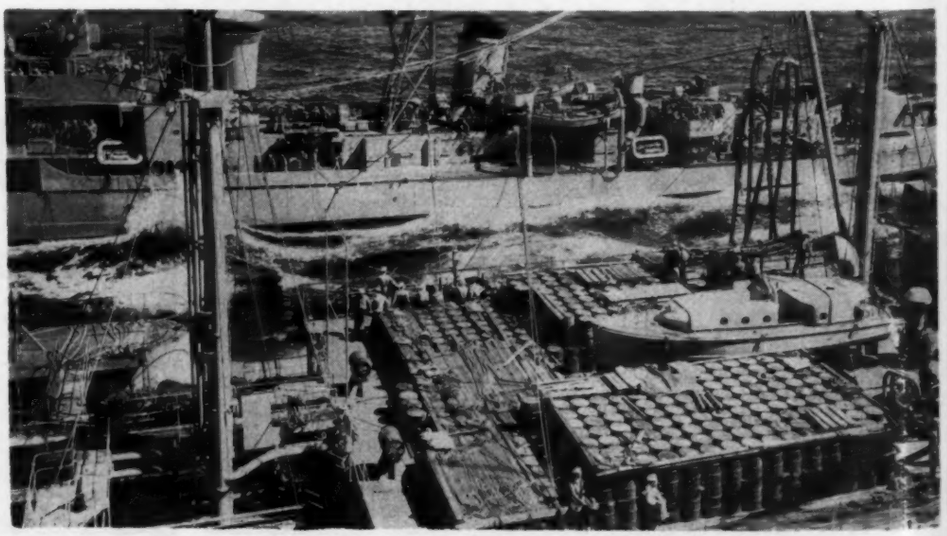
It was Major Cooper's belief that the routes of access from the Soviet Union into this area, being relatively narrow, could be successfully defended by comparatively small, mobile units. Oil men themselves, he said, have contributed much to the knowledge and techniques which would facilitate the holding of this strategic area. In these desert regions, oil companies have successfully overcome transportation problems through the perfection of large, 500 horsepower trucks that easily could carry from two to three tanks at high speed across desert wastes, traveling by the aid of a compass. Of great importance, also, is the fact that oil men in the area have solved much of the fresh water problem through techniques developed in the exploration for and charting of underground water courses, exact locations of which, it is believed, are not generally known to other countries.

Italian Consumption

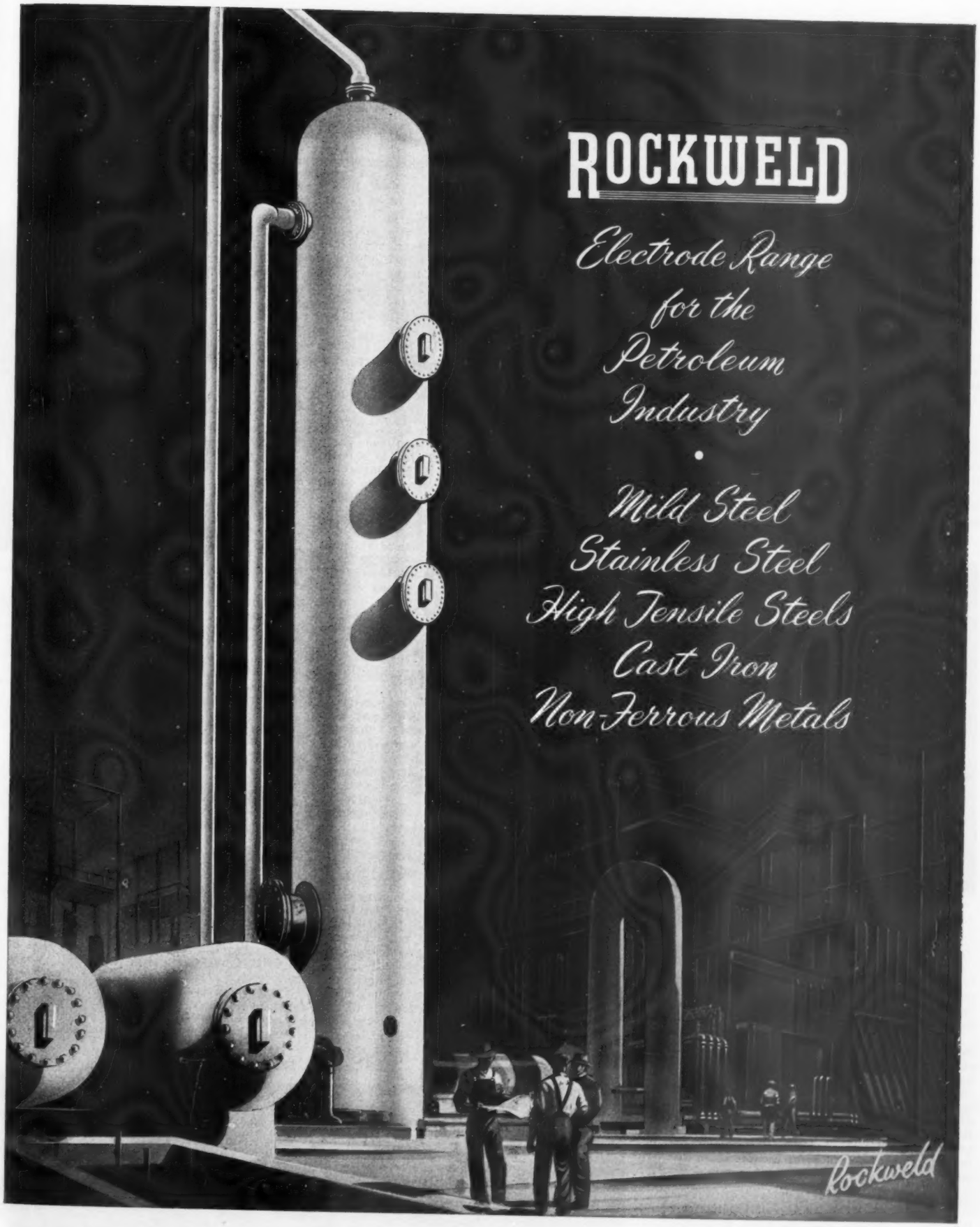
Gasoline demand in Italy has now returned to the prewar level of 14,600 barrels daily reached in 1937. Industrial fuel oil consumption also is continuing to rise sharply. Total oil demand in Italy was up 27.6 percent in the first quarter of 1950 to 92,500 barrels daily.

Gillespie Heads British Tankers

Robert Gillespie has been appointed managing director of British Tanker Co., Ltd. He has been a member of the company's staff since 1922 except for the war period during which he served as assistant director of the tanker division in the Ministry of War Transport. He returned to the company in 1944 a general manager to succeed the late J. R. Robertson.



U. S. Navy Tankship refuels a destroyer in Korean waters. Official Department of Defense photo.



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Oil company staff changes

ARTHUR M. McQUIDDY, former executive secretary of the New Mexico Oil and Gas Association, has joined the staff of the Western Oil and Gas Association as a public relations field representative. His particular function will be to coordinate the activities of the more than 100 area committees organized in connection with the association's "grass roots" public relations program in the five western states, it was announced by John M. Peirce, vice president and general manager of the association.

J. H. McDONALD has been elected vice president and secretary of the Arabian American Oil Co. Mr. McDonald started with the Standard Oil Company of Cal. in 1924 as a bookkeeper in the sales department and in 1943 became assistant to the vice president of foreign operations. In 1945 he joined the Arabian American as secretary and treasurer.

Jay E. Crane

JAY E. CRANE, a director of Standard Oil Co. (N.J.) since 1944 has been elected a vice president following the retirement of R. T. Haslam. The number of Jersey vice presidents thus remains at four.

Mr. Crane has grown up with the problems of international trade and foreign exchange. He started in the banking business about the time international currency restrictions appeared, and soon was actively engaged in that field. He came to Standard in May of 1935 as assistant treasurer, after serving as a deputy governor of the Federal Reserve Bank of New York. In 1937 he became treasurer and was elected a director in 1944. He became a regular member of the executive committee in 1949.

DR. MORRIS MUSKAT, formerly director of the physics division, Gulf Research & Development Co., has been appointed technical assistant to K. C. Heald, vice president of Gulf Oil Corp. Dr. Frank Morgan succeeds him as head of the physics division. Dr. Muskat joined Gulf's research organization in 1929. He was made director of the physics division in 1936.

ROBERT T. HASLAM, who recently retired as vice president and director of Standard Oil Co. (N.J.) after 23 years' service, has joined E. Holly Poe and Paul Ryan, as one of the principals of United States Pipe Line Co. Mr. Haslam has been elected president and director of United States Pipe Line Co., the new independent products pipe line system.

D. A. "DAVE" CARNAHAN was recently appointed Pacific Coast manager for Emsco Derrick & Equipment Co. He is succeeded as chief engineer of the D-B division by L. G. "Les" Evans.

DUNCAN D. ROBINSON has been made party chief of the seismic crew operating in Kuwait, by United Geophysical Co. L. A. Martin has returned to the United States after a tour in which he inspected United's operations in the Middle East.

ARNOLD G. SHIPP has been named assistant treasurer and general credit manager of its eastern division by Tide Water Associated Oil Co. He succeeds Samuel J. Kane, who has retired. Mr. Shipp has been with the company for 23 years, having started in the San Francisco office in charge of wholesale credits. For several years he has been credit manager of the New York department. He is president of the Association of Eastern Petroleum Credit Managers.

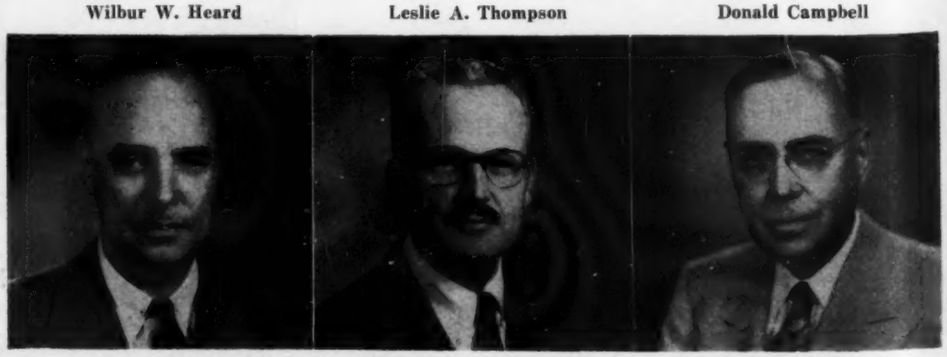
WILLIAM NADEN has been elected vice president and Herbert P. Schoeck a director by Esso Standard Oil Co. The appointments follow the resignation of Marion W. Boyer, a vice president and director, who has accepted the post of general manager with the Atomic Energy Commission. Mr. Naden, who joined the company more than 20 years ago as a chemist at the Everett, Mass., refinery, is a director and general manager of manufacturing. Mr. Schoeck started with Esso 33 years ago as an office boy and clerk and has been treasurer of the company since 1944. In recent years Mr. Naden has headed the company's employee relations. From 1934 to 1944 he was successively general superintendent of the Everett plant and the Baltimore refinery. In the latter position he was responsible for the accelerated construction of additional refining equipment to meet wartime aviation gasoline requirements. As director of refining for District I, PAW, he was charged with the coordination of refining activities and plant construction in the area and increasing the production of all war required oil products. He returned to the company in 1944.

L. E. Whitehead John M. Crawford

JOHN M. CRAWFORD, formerly superintendent of the gravity division of the geophysical department of Continental Oil Co., has been transferred to the development and research department, where, as supervising research geophysicist, he now heads the newly organized geophysical research division. L. E. Whitehead, formerly superintendent of the seismic division now heads both the gravity and seismic divisions. Frank Searcy, superintendent heads the equipment division.

DONALD CAMPBELL, general counsel for Stanolind Oil and Gas Co. since 1939, retired on Nov. 4, his 70th birthday. He was succeeded by Leslie A. Thompson, formerly general attorney. Wilbur W. Heard replaced Mr. Thompson as general attorney. Mr. Campbell became attorney for a subsidiary of Standard Oil Co. (Ind.) in 1921 and remained with that company in Montana until 1933, when he came to Tulsa to become a member of the law department of Stanolind Oil and Gas Co. He was made assistant general attorney in 1934 and general attorney in 1939. Later, his title was changed to general counsel. Mr. Thompson joined the Midwest Refining Co. in 1916, remaining with that firm until 1931. He has been a member of the Stanolind law department in Tulsa since 1931, and has been general attorney since July, 1947. Mr. Heard has been affiliated with Stanolind since 1936. He was named assistant general attorney last May.

Wilbur W. Heard Leslie A. Thompson Donald Campbell



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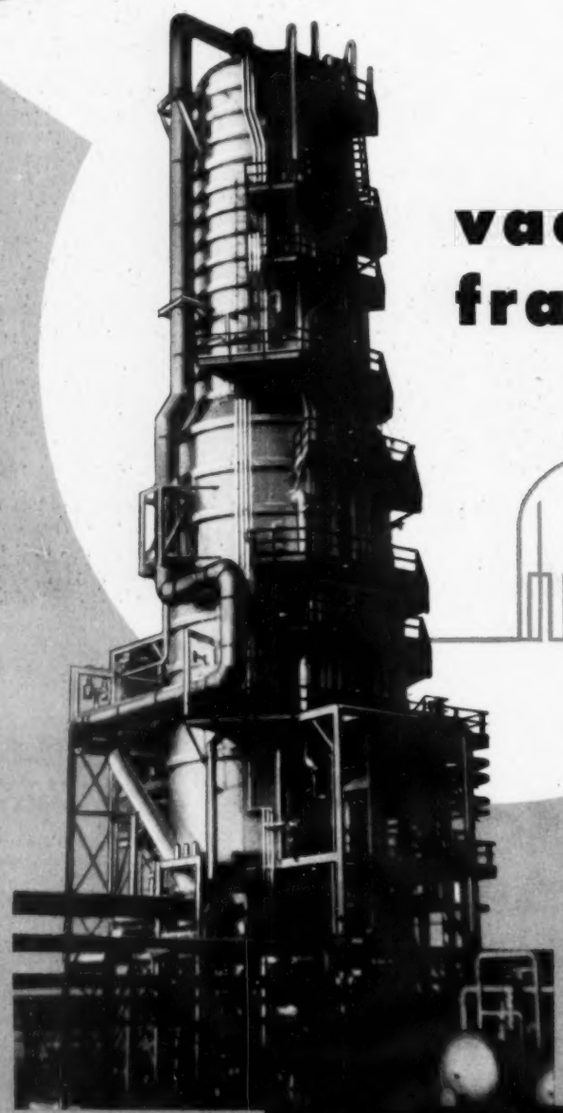

vacuum fractionation

Vacuum Fractionating Units, designed and constructed by Foster Wheeler, are in operation in petroleum refineries throughout the world. They range in capacity from less than 1000 bbls/day to 37,000 bbls/day, the design capacity of the unit illustrated here. This unit was recently placed in operation at the Amuay Bay refinery of the Creole Petroleum Corporation.

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Frank C. Fahnestock

FRANK C. FAHNESTOCK, technical advisor since 1948 to the chief engineer, refinery engineering division of Socony-Vacuum Oil Co. Inc., has been appointed coordinator of foreign refining. Mr. Fahnestock started with Socony-Vacuum as a student engineer and held various operating jobs at the Paulsboro, N. J., refinery until 1939, when he was transferred to the refinery engineering division. He was the United States member of the Allied Oil Working Party for Western Germany from March to May 1949, and ECA consultant on oil for western Germany from March to May 1950.

JACKSON M. BARTON, formerly director of exploration for the Cooperative Refinery association, Kansas City, Mo., has been appointed manager of Deep Rock Oil Corporation's geological department. Mr. Barton worked five years for Magnolia Petroleum Co. after completing his graduate studies at Yale. In 1946 he joined the Cooperative Refinery association.

C. E. MURRAY of Bartlesville, Okla., vice president and secretary of Cities Service Oil Co. (Del.) and affiliated companies will retire on Jan. 1 after completing almost half a century of active service with the company. This is one of the longest employment records of any Cities Service employee.

J. R. MAXEY, former chief geophysicist for the Deep Rock Oil Corp. has entered the consulting business in Tulsa, specializing in review and evaluation of seismic and geological prospects. Previous to going with Deep Rock he had been connected with the Humble Oil and Refining Co., The Carter Oil Co., Sohio Petroleum Co. and the United Geophysical Co.

J. R. Maxey

DR. ROBERT B. KILLINGSWORTH, assistant director, technical service department, Brooklyn, has been transferred to the headquarters staff of Socony-Vacuum Laboratories, a division of the Socony-Vacuum Oil Co., Inc., 26 Broadway, New York.

Cornelius B. Watson

Cornelius B. Watson, a director and formerly vice president in charge of marketing, refining and transportation of The Pure Oil Co., died Nov. 2 of a heart attack at his home in Chestertown, Md. He was 63 years old. Mr. Watson was born in Bradford, Pa., and much of his early life was spent in Parkersburg, W. Va., where his family operated as oil producers.

Wallace Trevor Holliday

W. T. Holliday, 66, chairman of Standard Oil Co. of Ohio, died on Nov. 7 at Cleveland. He was president of the company for 21 years prior to 1949 when he was elected chairman. Mr. Holliday joined Kline, Tolles and Goff, Standard Oil lawyers in 1908 at Cleveland and subsequently became a close friend of the elder John D. Rockefeller. He was made general counsel of Standard of Ohio in 1917 and president in 1928. Company sales totaled $44 million in 1928 and had risen to $257 million in 1949 when he relinquished the presidency.

Paul Courtney

Courtney Heads Emsco Sales

Paul Courtney, vice president of Emsco Derrick & Equipment Co. and former manager of the Houston plant, has been appointed general manager of sales for all Emsco products, including D/B sales. Mr. Courtney, who has been with Emsco since 1938, is headquartered at Houston, Texas. J. T. Tucker continues as sales manager.

S. A. Martin, former assistant plant manager, succeeds Mr. Courtney as manager of the Houston plant, and F. M. Martin, no relation, becomes assistant plant manager.

Crane Promotes Greene

J. W. Greene has been appointed to the newly created position of assistant manager of the valve and fitting department, Crane Co., Chicago. Mr. Greene is particularly well qualified for this new responsibility as a result of twelve years experience in the oil fields of the southwest; ten years in the New York and eastern industrial markets, and five years in the mid-west. His most recent position with the company was sales manager of the New York branch.

To Head IDECO's Columbus Division

C. Edwin Ponkey has been appointed general manager of the International Derrick and Equipment Co., Columbus division, to succeed Ferguson Barnes, resigned. Mr. Ponkey resigned as vice president of the Sheldrick Manufacturing Corp. to accept his new position.

J. B. Harshman

J. B. HARSHMAN has been named vice president in charge of the pipeline division of H. C. Price Co., pipeline constructors of Bartlesville, Okla. He succeeds, J. P. Neill resigned. The new vice president comes from Fish Constructors of Houston. During the past year and a half Harshman has been located in the east, supervising construction operations on the New Jersey-New York end of the Transcontinental Gas Pipe Line Co. project.

Heads IHC Foreign Operations

Joseph E. Layton has been appointed director of foreign operations for International Harvester Co. He succeeds Edward M. Ryan, recently named vice president in charge of foreign operations. The two executives assumed their new duties Nov. 1. Moving into position of assistant director of foreign operations, previously headed by Mr. Layton, is R. B. Bradley who formerly was director general of European operations. Bradley, in turn, is succeeded by Harris E. Swanberg who comes to the directorship of the firm's European operations from the general managership of A/B International Harvester Co., Harvester's subsidiary in Sweden.

JOHN H. JENNINGS has joined Deep Rock Oil Corp. as evaluation engineer. He had been petroleum engineer for the Ohio Oil Company's Tulsa division for the past five years.

JOHN FULLEMAN, internationally recognized authority on engine supercharging and centrifugal compressor design, has been at work for several months with the engineering staff of The Cooper-Bessemer Corp., Mt. Vernon, Ohio. He is coordinating a broad engine development now under way at Cooper-Bessemer's headquarters plant.

John Fulleman

How you can up-grade valve replacements

...without major investment

Why does a valve need replacing? Because it has either failed to operate, or cannot adequately handle the fluid. Replacing old style valves with like valves is usually force of habit—and it's easy to become a victim of habit. The way to break a bad habit is to substitute a new and better habit.

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Take a manifold, for example. It may have a dozen or so old valves, some of which are giving you trouble. Requisition a Nordstrom for each replacement. Eventually the entire manifold will be 100% Audco-Nordstrom—completely modernized, trouble-free, leak-free, equipped to save operator's time.

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To Celebrate Spindletop Anniversary

On January 10 the oil industry of Texas will celebrate its fiftieth birthday as a major industry. It was fifty years ago that Capt. Anthony Francis Lucas drilled in the famous Spindletop discovery well which created a 100-acre lake of oil before it was shut in.

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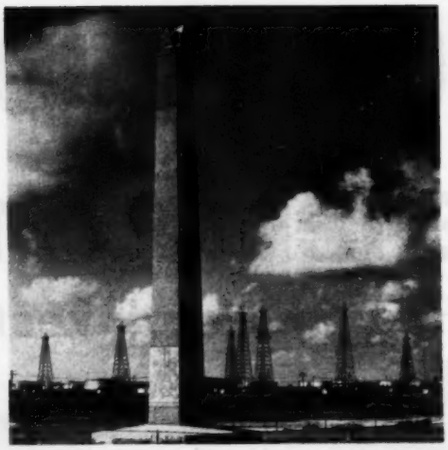

The Spindletop Monument, a towering shaft of granite 58 feet high, honors the Lucas well and the Spindletop pioneers. It was dedicated Oct. 9, 1941, during the convention at Beaumont of the Texas Mid-Continent Oil and Gas Association.

Oil men of the area, particularly in Beaumont and Port Arthur, have organized the Spindletop 50th Anniversary Commission headed by John W. Newton of Magnolia Petroleum Co. and assisted by Phil S. Justice, Sun Oil Co., vice chairman; Scott W. Myers, independent operator; I. F. Betts, banker; W. W. Leach, Magnolia; Marion E. Brock, Gulf Oil Corp.; F. L. Wallace, The Texas Co.; C. W. Cooper, The Pure Oil Co.; and Dr. A. M. McAfee, Lamar State College of Technology.

The anniversary activities will continue throughout 1951, but the focal point will be the ceremonies planned for Beaumont during the week immediately preceding and particularly on Jan. 10, 1951 which has been designated "Spindletop 50th Anniversary Day" through appropriate proclamations by the governor of Texas and the mayor of Beaumont. The culmination of the many preliminary events leading up to this main observance will be an evening program where the whole impact to the Spindletop discovery on modern civilization will be crystallized in a series of speeches. These will be given before a specially invited audience to include, among others, representative leaders throughout the nation from the petroleum and allied interests, industrial organizations, the military and other governmental agencies, and community groups.

On the Monday afternoon immediately preceding the main observance ceremonies a barbecue will be staged for oil field and refinery workers in this general area. Special guests for this occasion will include labor leaders, labor relations representatives and company officials.

Four major petroleum industry conventions already have been arranged for Beaumont during 1951. Conventions thus far arranged include: American Petroleum Institute spring production meeting, southwestern division; Texas Independent Producers and Royalty Owners; National Oil Scouts and Landmen's Association; and Texas Mid-Continent Oil and Gas Association.

An educational and historical exhibit based on the theme of "then and now" will be maintained intact throughout 1951. It will include historical documents photographs, graphic panels, dioramas and as many examples as available of original tools, equipment, methods and processes developed by the industry to be displayed against a background of photographic murals of their present-day counterparts. Consideration is being given to the establishment of a permanent Spindletop Historical Petroleum Museum at the close of the celebration.

Pipe Line Rates Set

Interprovincial Pipe Line Co. in Canada and its United States connection Lakehead Pipe Line Co., Inc. have announced a rate of 54 cents per barrel from Edmonton and 56 cents from Redwater to Superior, Wis. The line now is in operation and is filling tankage at Superior in anticipation of the opening of lake traffic next spring.

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Virginia Electric and Power Company instituted an expansion program in 1944 to more than double their electric generating capacity. These new power stations and extensions, three of which are illustrated here, are outstanding examples of efficient design for consistently reliable year-in, year-out, high-capacity performance. Facilities for this program, completed and in process of completion, will produce a total of approximately one-half million kilowatts. Design and construction are by Stone & Webster Engineering Corporation.

1. *Chesterfield Power Station, first with an installed rated capacity of 50,000 kw, has been extended with an additional installed rated capacity of 60,000 kw.*
2. *Recently completed Bremo Power Station extension, 60,000 kw rated capacity.*
3. *Possum Point Power Station where an extension of 60,000 kw rated capacity is under construction.*

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Ralph C. Cole

Cole Joins Southern Geophysical

Ralph C. Cole has joined Southern Geophysical Co. as a supervisor, Dr. Sidon Harris of Fort Worth, president of Southern, has announced. Southern has offices in Fort Worth and Midland and 12 seismograph field parties now operating in Texas, New Mexico, Louisiana, Arkansas and Kansas. Cole has been in geophysical work since 1934, in southern and mid-continent states working for Stanolind Oil & Gas Co. and geophysical companies.

Makes Lube Plant from Surplus Units

How surplus, unused units were converted into a modern solvent refining, lubricating oil plant at a saving in materials estimated in the millions is told in the current issue of the *Kelloggram* just published by the M. W. Kellogg Co. The 1500-barrel-per-day plant, designed and constructed for the Phillips Oil Co. at Kansas City, Kansas, has completed its first year's run. Before Phillips and Kellogg went to work back in 1948, the plant was a surplus alkylation-isomerization unit comprising 45 major vessels with necessary heat exchangers, pumps and other auxiliaries. Wherever possible this equipment was used in the conversion, according to Kellogg.

When the job was completed Phillips had a lube plant comprising two-stage vacuum distillation, propane fractionating and deasphalting, phenol treating, propane dewaxing, clay treating and deodorizing. According to Kellogg, the most complete picture of the conversion itself may be found by considering the phenol treating unit. Here, five towers in the former butane isomerization section were converted directly into the five main towers of the phenol unit. None was removed from its foundations. In some cases tray designs were changed, in others the bubble caps were altered, new nozzles added, old ones closed off.

Had Kellogg bought new, main towers for the phenol unit, the cost would have run in the neighborhood of $170,000 for the towers alone. Add to this the large savings in erection costs, foundations, steel works, heaters, mechanical equipment, heat exchangers, piping, building and instruments, and the total labor and material savings reaches a significant figure on just this one section of the completed plant, it is stated in the *Kelloggram*.

Petroleum Attache Transferred

Stewart Anderson, Second Secretary of the United States Embassy at Bogota, Colombia, has taken over the duties of petroleum attaché following the transfer of Wilson Clark who formerly held this position. Mr. Clark has been summoned to Washington and will be assigned to another post in the diplomatic service.

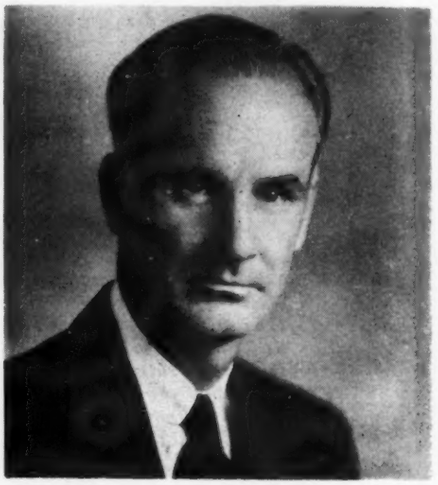
Develops New Catalyst

Filtrol Corp. has developed a very hard type regular Filtrol TCC catalyst and new very hard SR (sulfur resistant) pelleted catalyst. These catalysts are suited for Houdriflow and Socony airlift units. Filtrol is proceeding with a $1,000,000 construction program which will permit manufacture of these catalysts in large quantities by late spring of 1951.

McPeake Heads Aldrich Pump Sales

R. H. McPeake has been appointed sales manager of The Aldrich Pump Co., Allentown, Pa. He has had many years oil company and equipment experience in both the United States and Latin America. After eight years with Standard Oil Co. (N.J.) he joined The Oil Well Supply Co. as export sales manager, resigning in 1942 to join the U. S. Navy.

R. H. McPeake



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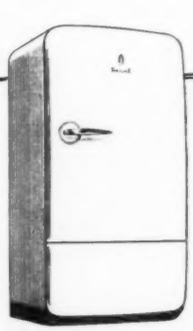
Servel's single, compact central unit refrigerates scorching air down to a restful, zestful temperature. It wrings out wilting, soggy humidity, bringing the dry, sharp tang of fresh, spring air to every room in homes, offices, stores, clinics, drafting rooms.

Oversize filters remove dust, dirt, sand, and irritating pollens from the air. When the prevailing outdoor temperatures are comfortable, your Servel gives you draft-free air circulation.

All year round, you have just the temperature and humidity you want. You simply dial your favorite temperature, and flip a switch, for cooling—or heating. You get all this healthful, efficiency-building comfort without burdening your present source of electricity. For Servel uses whatever energy you have the most of—butane, propane, natural, manufactured gas, or steam.

Users everywhere in the world report complete satisfaction with their Servel *All-Year* Air Conditioners. Send us your name and address—we'll rush you full details. Just write Servel, Inc., International Division, 20 Pine Street, New York 5, N. Y., U. S. A



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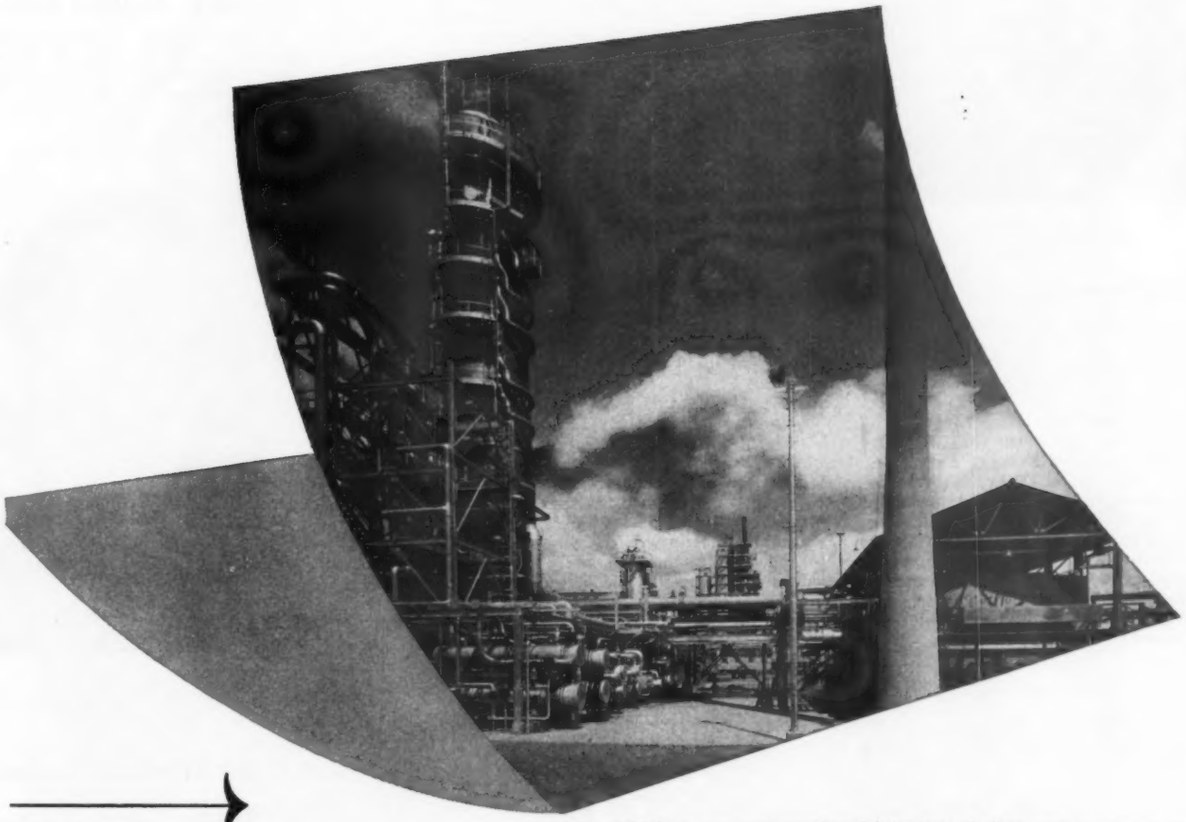

In mid-July a new and complete lubricating oil plant went on stream at SOHIO's large Lima refinery. Lummus designed and built four of the five processing units which will produce approximately 1800 barrels per day of high grade lubricating oils.

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Forms Information Division

An information division to integrate technical information activities at the Ethyl Corp. research laboratories in Detroit has been established under the supervision of B. H. Weil, formerly head of the technical information division, State Engineering Experiment Station, Georgia Institute of Technology and before that with Gulf Research and Development Co. at Pittsburgh. Bernard A. Jones, formerly head of the Ethyl laboratories' technical data section, has been named operations manager, and Charles B. Kass and Donald MacDonald have been assigned as engineer-writers to the information division's staff. Mr. Kass has previously served as a technical representative in Ethyl's technical service division, while Mr. MacDonald was assigned to automotive research operations at the laboratories.

The collection, cataloging, and reporting of technical material will be among the responsibilities of the information division. Other functions will include the preparation of technical information for use by other departments of the company.

Aromatics Production By Platforming

Universal Oil Products Co. has been conducting intensive studies on the production of benzene through Platforming, and has discovered that the process, now being used to improve the quality of motor gasoline, will successfully produce benzene in practically unlimited quantities. Announcement of this development was made by Dr. Gustav Egloff, director of research for U.O.P.

Dr. Egloff pointed out that approximately 170,000,000 gallons of benzene will be produced during 1950, but if there should be an all-out war we would require at least twice this amount for the many essential uses to which benzene would be put. Present production facilities cannot attain the necessary figure. Imports could not supply the deficiency.

In addition to producing benzene, Universal has discovered that Platforming will make large quantities of toluene for explosives and as an important component in fighting grade aviation gasoline.

Dr. Egloff said that producing benzene from petroleum through Platforming would save millions of dollars in installation and operating costs as compared with other methods to produce the chemical. He estimated that adequate units could be built and operated in less than a year with a minimum requirement of critical materials and technical manpower. The quantity of petroleum needed to produce an additional 35 million gallons of benzene which is approximately the amount required to meet current increased use, would be less than one-twentieth of one percent of our total petroleum production, he said.

Prospecting Party Flies to Papua

An oil prospecting party left London by air recently to undertake operations in Papua on behalf of the Australasian Petroleum Co. The party consists of eight members of Seismograph Services Ltd., contractors for this work. Technical equipment also was transported by air. The Australasian Petroleum Co. resumed exploration work in Papua after the end of the war, and at present has three drilling rigs in operation. (WORLD PETROLEUM Sept. 1950)

Roy C. Hackley Joins Houdry

Houdry Process Corp., Philadelphia, has appointed Roy C. Hackley, Jr. as vice president in charge of patents and licensing. He has been special assistant to the U. S. Attorney General since 1943.

Roy C. Hackley

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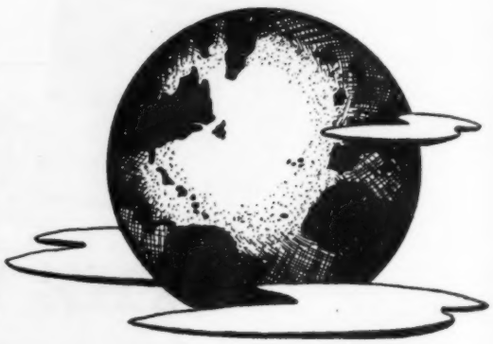

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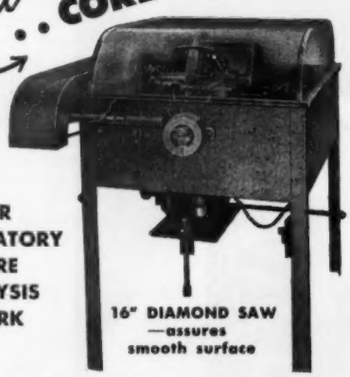

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Turkey's Petroleum Progress

(Continued from page 43)

Based on the rapid industrial development of the country, plus the system of mechanized state farming, optimistic predictions are made that Turkish consumption, which increased two and a half times during the past decade, may rise to 750,000 tons by the time the European Recovery Program has run its course. Hopes are expressed that domestic production may supply a substantial part of these requirements.

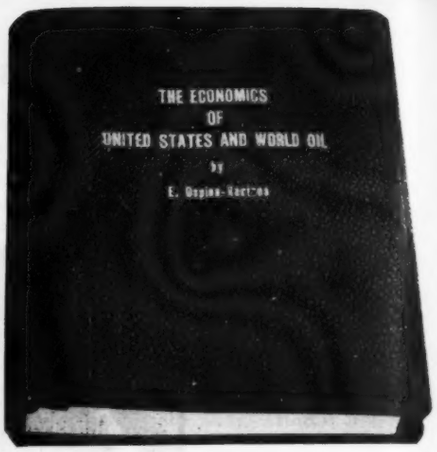
The general director of Turkey's oil development program is Ihsan Ruhi Berent. Assistant director is Necmaddin Danisman, while the director of technical development is Mazlum Oget. The head geologist is Necdet Egeran; the production engineer is Abudrrahman Durukal; and the adviser to the oil department is Cevat Tasman, who, like Mr. Berent and others in Turkey's petroleum picture, has had American study and experience.

An interesting incidental sidelight on Turkish petroleum is that 12 locomotives on the Kurtalan-Madden run are burning unrefined Ramandag oil, and experiments are in progress to carry this practice further. One facet of Turkey's industrial improvement program is the conversion of all railway transport equipment in the eastern part of the country to oil burning.

Breaking ground for the new 1,500-barrel UOP platforming unit to be built by Premier Oil Refining Co. at its Fort Worth, Texas, plant. President R. P. Hargis is officiating with the shovel. Standing with him are L. B. Connelley, superintendent of the Fort Worth plant; N. Y. Jones, administrative superintendent at Arp; and J. E. Bullock, administrative superintendent at Baird. Kneeling are L. G. Dufilho, general superintendent; and Elmer Smith, superintendent at Longview.

Union Buys Site

Union Oil of Canada has purchased a block of land on Burrard Inlet in Burnaby Municipality, the district in which most of the refineries serving the Vancouver and lower mainland districts of British Columbia are located. Union left the B. C. field a number of years ago, but earlier this year announced that it was planning to return.



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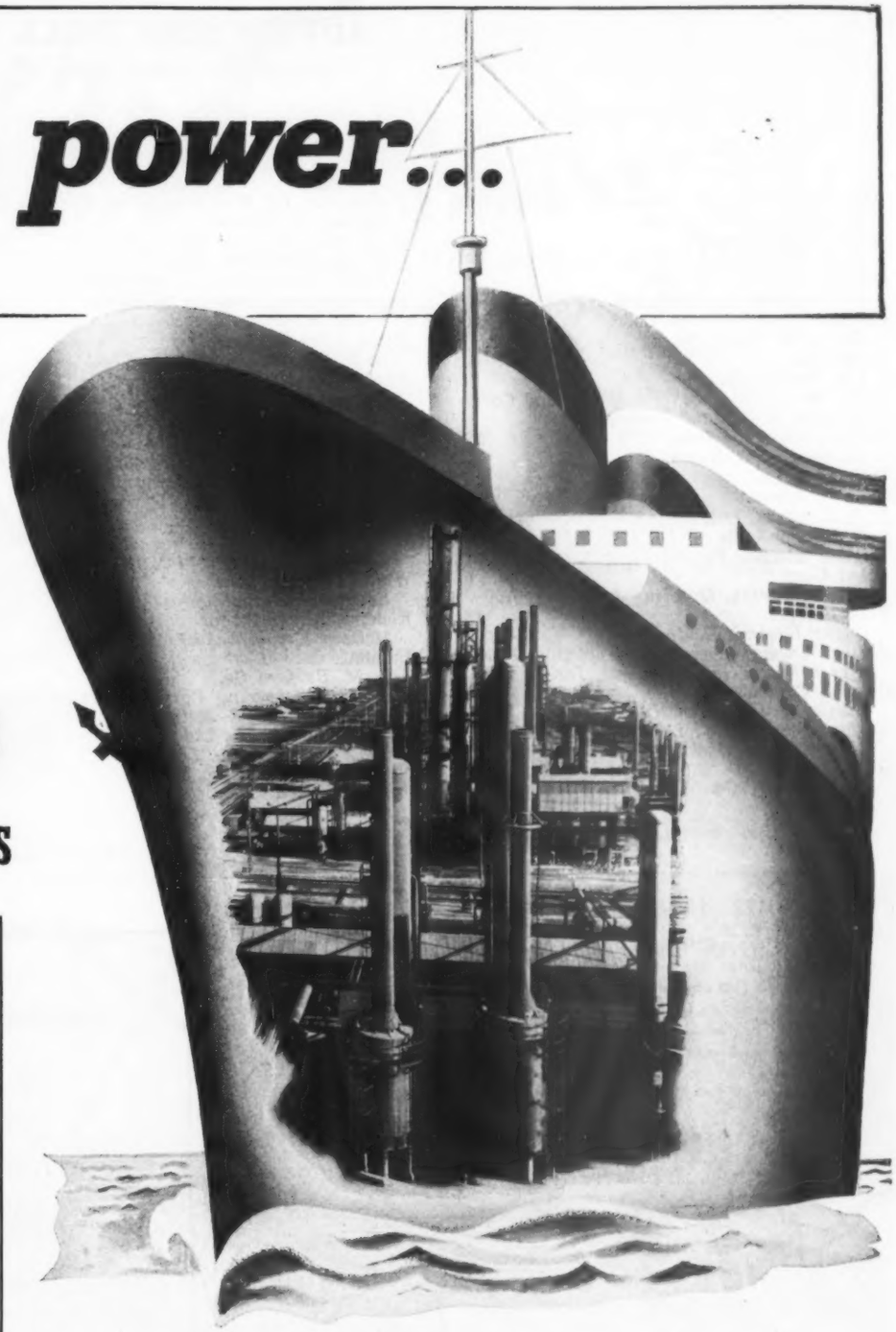

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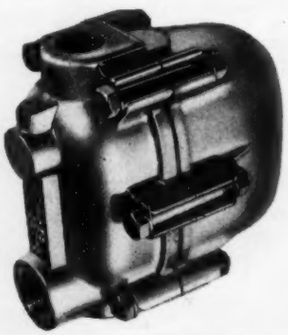

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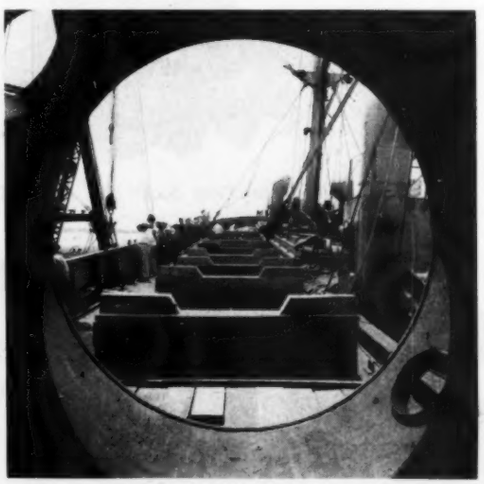
Left: View showing the debutanizer tower being transferred from the dock to the ship on a derrick barge. Prior to this, the tower was shipped by rail from our Birmingham plant to the dock at New Orleans, Louisiana. The derricks then transferred it from the flat-car to the barge.

Right: This view shows the cradle that was constructed on the port deck, forward, of the S.S. Volunteer State. The tower was lashed in place on this cradle during the sea voyage.



Left: Close-up view showing how the tower was picked up by two heavy derricks on the barge and hoisted aboard the ship. Part of the cradle for the tower can be seen in the lower right-hand corner of the view.

Right: The tower has just been lowered onto the deck of the "Volunteer State". This ship carried the tower from New Orleans to Southampton, England, where it was unloaded and transported to the Anglo-American Oil Company's refinery at Fawley, England.

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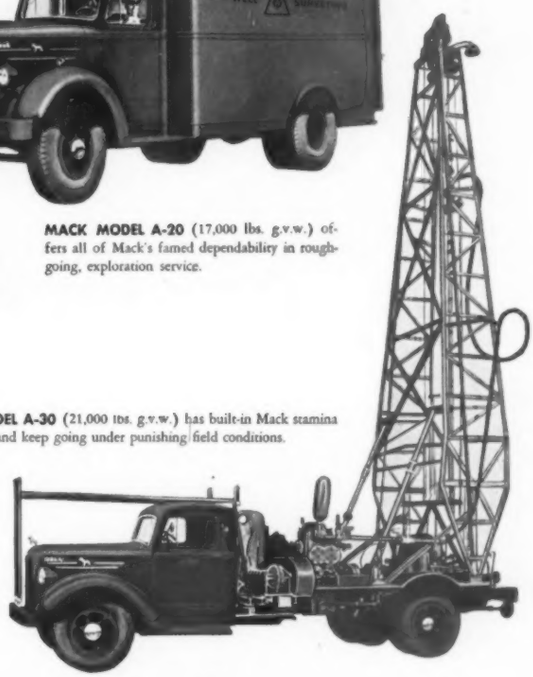

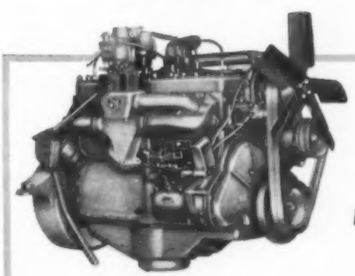

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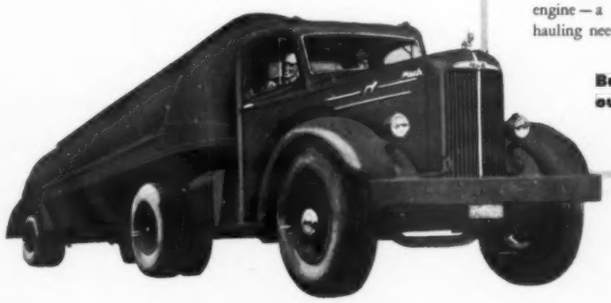

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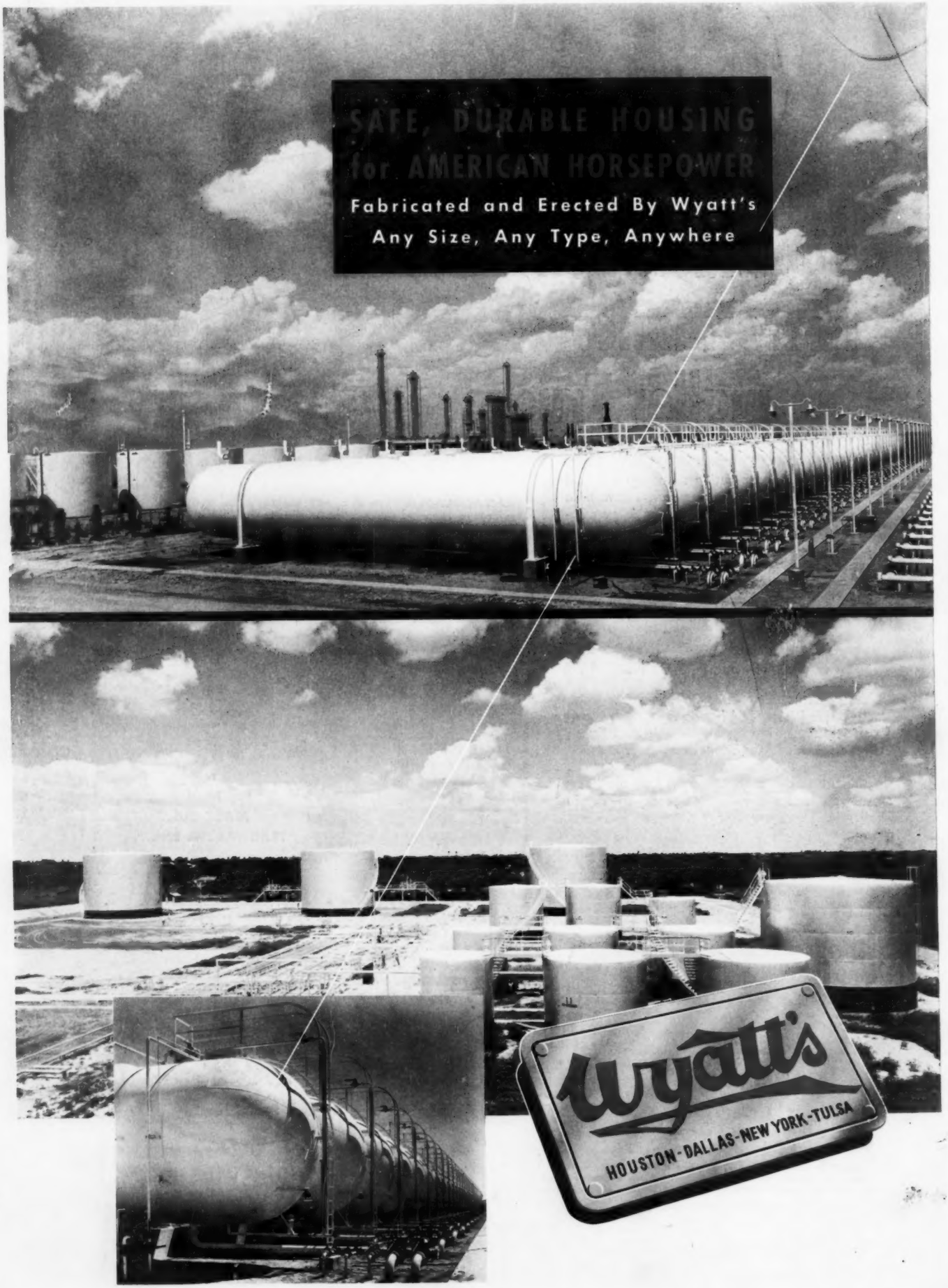
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